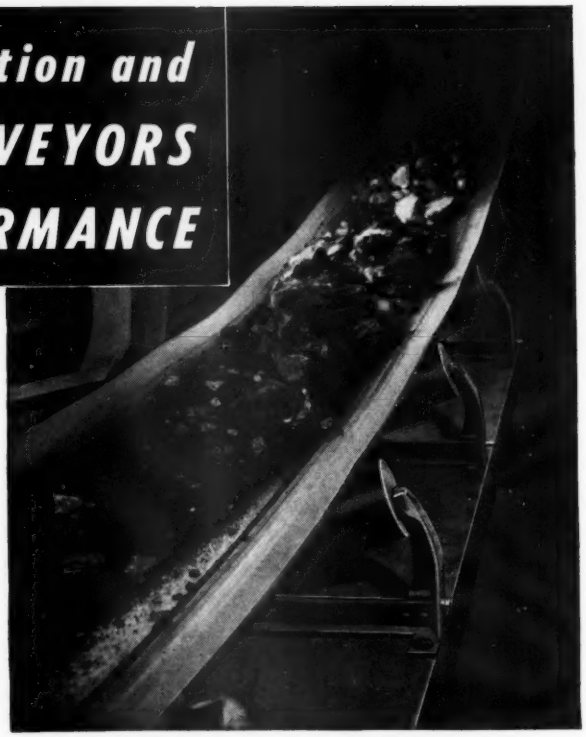
Mining

CONGRESS JOURNAL

How Engineering Selection and Design of BELT CONVEYORS Improve PERFORMANCE

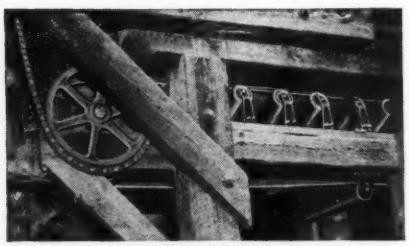


L-B belt conveyor carries magnesite ore from mine dump to crushing plant.

SUCCESS of Link-Belt belt conveyor installations in raising production rates and cutting handling costs, with a minimum of maintenance, is due not only to the most advanced design and construction of Link-Belt carrying and return idlers, but also to:

- properly designed terminal drive machinery.
- efficient discharge chutes at terminal and discharge points.
- a design of welded steel pulleys that reduces shaft deflection.
- highest mechanical efficiency in speed reducers, direct coupled or chain driven.
- engineering experience to produce the proper relationship between pulley diameter and ply thickness of belt; also between size of material handled and conveyor belt width, equality of rubber covering, carcass specifications, etc.

The user gets the benefit of this experience when he selects Link-Belt belt conveyor equipment—idlers, trippers, drives, pulleys, bearings, take-ups, belts.



Top, left: Drive end and discharge chute of L-B belt conveyor.

Center, left: L-B rubber tread idlers on return flight of belt, loosen and remove sticky material clinging to belt.

Bottom, left: L-B impact idler, giving cushioned support of belt at loading point. Greatly lessens wear on belt.

In the crushing, screening and preparation of iron ore, copper, nickel, molybdenum, bauxite, gold, silver and other ores, Link-Belt conveyors handle the material from one operation to the next. Belt conveyors carry the ore out of open-pit mines. Steel for ships, cars, buildings and its innumerable other uses is rolled, cast, formed, with the help of Link-Belt conveyor and drive chains. Bucket elevators, skip hoists, apron conveyors, belt conveyors handle coal, coke, ore, stone, on arrival at the mill. Consult Link-Belt specialists on any phase of conveying or mechanical power transmission.

LINK-BELT COMPANY 10,572A

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices in Principal Cities.

LINK-BELT
Conveyors
A TYPE FOR EVERY KIND OF MATERIALS HANDLING

Mining Congress Journal

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THE AMERICAN MINING CONGRESS
1102 RING BLDG., WASHINGTON 6, D. C.

HOWARD I. YOUNG, *President* DONALD A. CALLAHAN, *Vice President* ANDREW FLETCHER, *Vice President* JAMES D. FRANCIS, *Vice President* JULIAN D. CONOVER, *Secretary*

Cars and trucks rebuilt several times —Timken® bearings still going strong

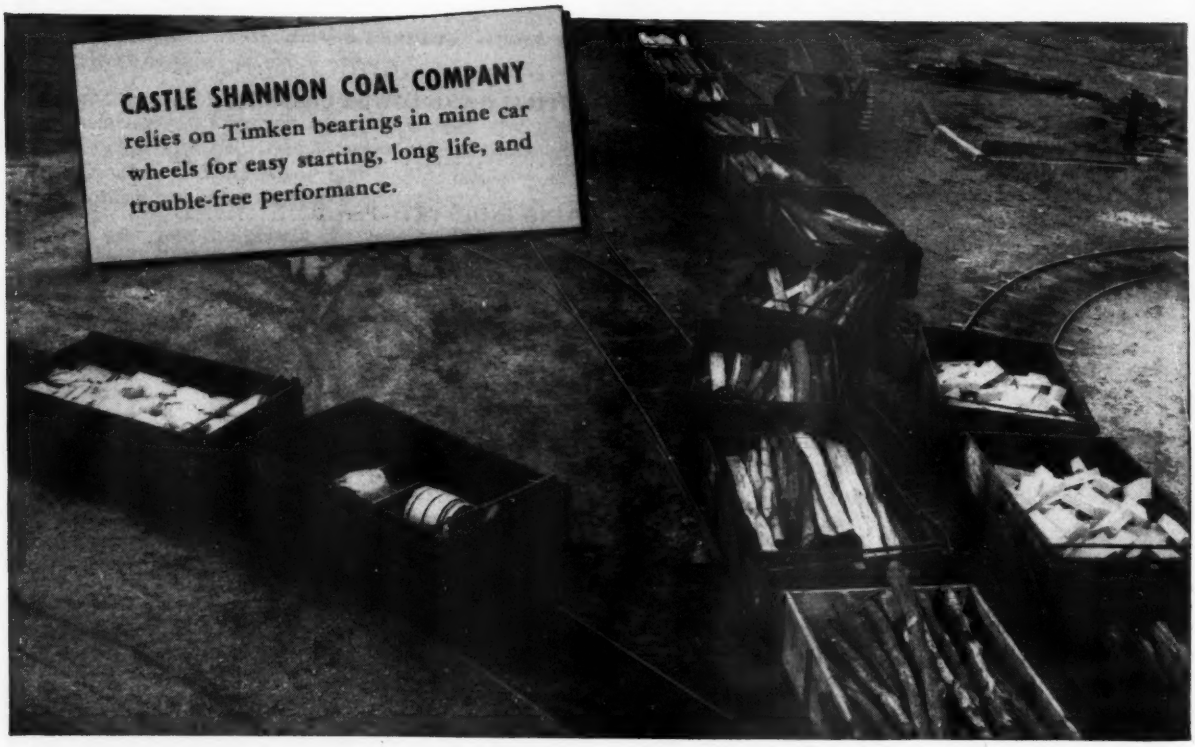
AT the Castle Shannon Coal Company in Cloverdale, Pennsylvania, 526 Timken-equipped mine cars have been in service since 1926. Although the cars and trucks have been rebuilt several times, the original Timken bearings are still good for many more years of dependable service.

Timken bearings normally outwear the mine cars in which they are used. They reduce friction, permit easier starting and faster speeds, and save lubrication and maintenance time. With Timken bearings on the axles, the number of loaded cars in a train can be greatly increased. Power costs are cut. Mine operators are free from the problems of belled-out hubs, worn axles, and worn-out thrust washers.

Due to the line contact between rolls and races, Timken bearings have tremendous load carrying capacity. Their true rolling motion and incredibly smooth surface finish enable Timken bearings to operate freely, without friction. Their tapered construction carries any combination of radial and thrust loads. And Timken bearings permit closures which keep lubricant *in,* dirt and grit *out.*

No other bearing can give you *all* the advantages you get with Timken bearings. Be sure every mine car you buy is equipped with Timken bearings, and always look for the trade-mark "Timken" on the bearings you use. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN BEARING EQUIPPED — *This symbol on a product means its bearings are the best.*


CASTLE SHANNON COAL COMPANY
relies on Timken bearings in mine car wheels for easy starting, long life, and trouble-free performance.

WE MAKE OUR OWN STEEL

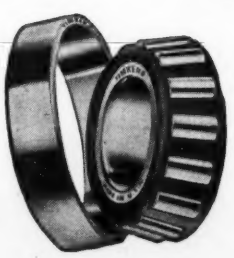
The special grade alloy steel which gives Timken bearings their strength and resistance to wear, is made in our own steel mills. It's the sure way to positively assure uniformly high quality.

The Timken Company is the only bearing manufacturer which makes its own steel, and leads in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TRADE MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⊂⊃ THE TIMKEN TAPERED ROLLER ⊂⊃ BEARING TAKES RADIAL ◎ AND THRUST →◎← LOADS OR ANY COMBINATION →✳←

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Miners lift less dead weight when they set Alcoa Aluminum Header Beams at the working faces. Aluminum beams weigh less than ½ as much as steel or oak beams of equal strength. You can use Alcoa 61S-T6 Aluminum Header Beams again and again. Are long-lived . . . need no painting. They are fireproof and rotproof.

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This rugged mine cable far exceeds all requirements of the Pennsylvania Flame Test. Specially compounded, heat resisting insulation *plus* flame resisting Neoprene jacket make possible this exceptional protection against cable fires. Special bonding, D-shaped insulation and seine twine webbing give toughness, durability and freedom from kinking.

Invest in Securityflex for safe, continuous mine operation! Anaconda Wire and Cable Company, 25 Broadway, New York 4, New York.

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No waiting for most regular items at your Crane Branch or Wholesaler

Stock bins are rapidly filling up at local Crane outlets. Day by day . . . in valves, fittings, steam specialties, and accessories . . . brass, iron, and steel . . . the selection keeps rounding out.

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RESPONSIBILITY
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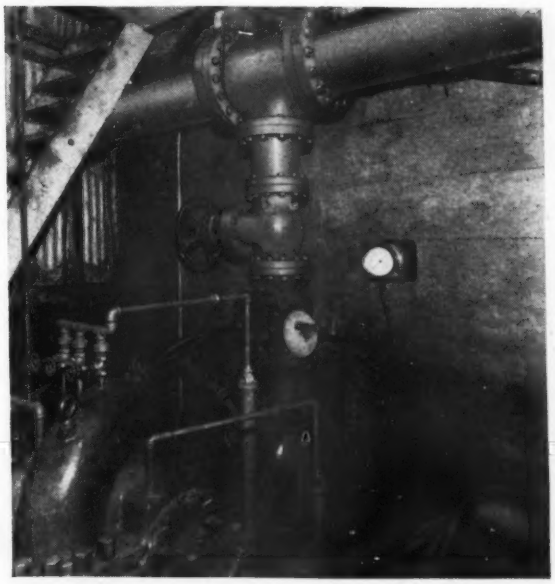
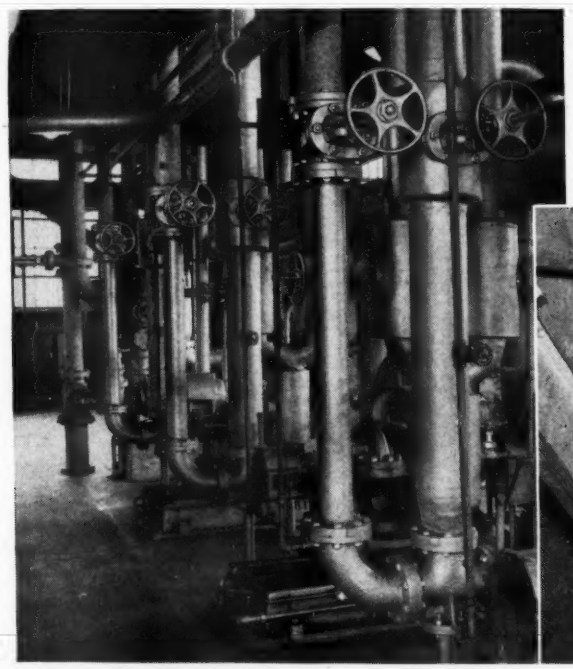
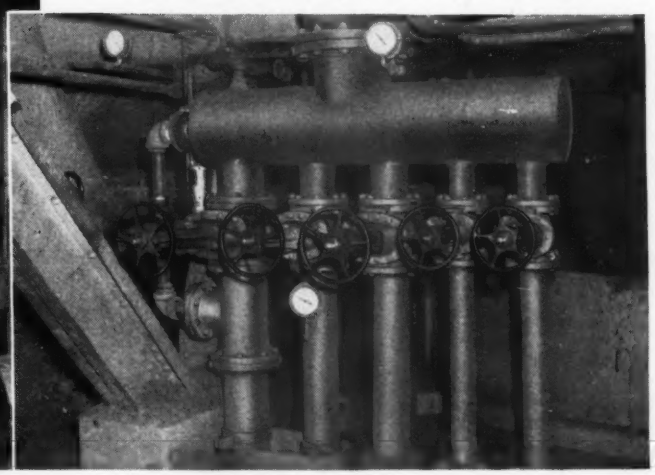


LIFTING WATER 1960 FEET *through a Crane-equipped piping system featuring 250-pound iron valves and fittings.*



A LARGE BREAKER PLANT'S *power house showing boiler feed piping, equipped from the complete Crane line.*



MANIFOLD TO PEA AND BUCK CONE *in breaker plant; also to agitator rings and classifier. One order to Crane gets all the piping materials.*

EVERYTHING FROM . . .

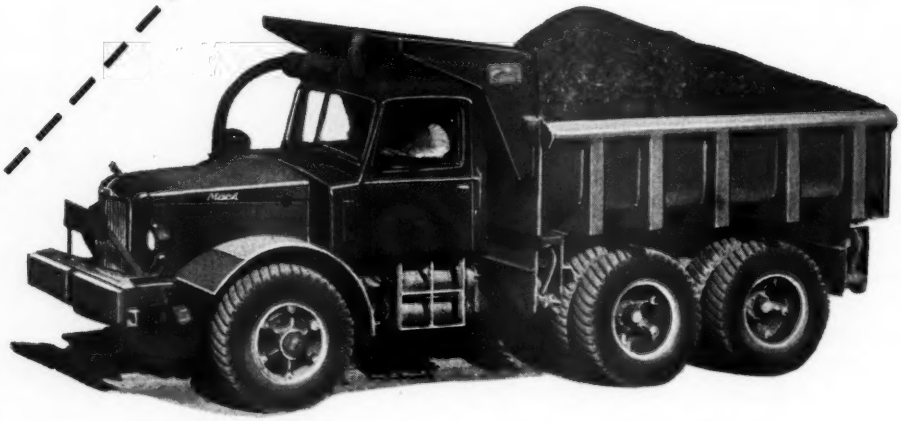
VALVES
FITTINGS
PIPE

CRANE

PLUMBING
AND
HEATING

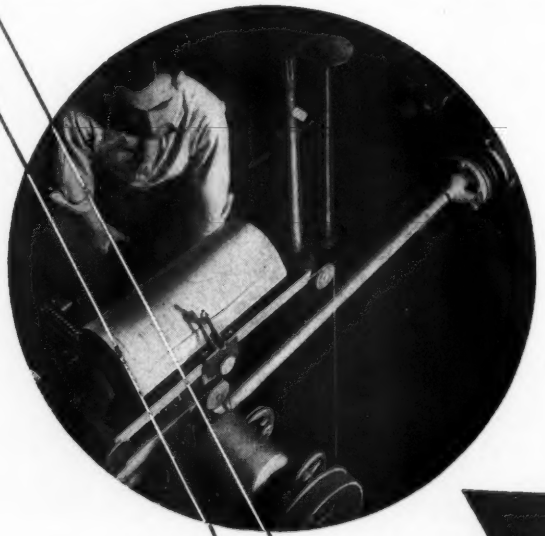
FOR EVERY PIPING SYSTEM

you get more work out of Mack Trucks



There's good reason why you find so many hard-working Mack dump trucks engaged in open-pit mining. Profit-wise mining men know that the true measure of a truck is the way it pays off—in work. They know, too, that when it comes to working harder and lasting longer . . . at lowest cost—there's nothing on wheels to beat a Mack.

because..we put more work into Macks



There is no guesswork about the stamina of Mack parts. This testing machine determines the strength and elasticity of Mack axle shafts by imposing measured torque up to point of fracture. Sample shafts are tested to destruction, thus insuring that all Mack shafts fully measure up to Mack's exacting standards.

Mack Trucks, Inc., Empire State Building, New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada, Mack Trucks of Canada, Ltd.

6218

SINCE 1900, AMERICA'S HARDEST-WORKING TRUCK

LUBE MEMO

Easy way to end sticky valve trouble

Sticky gum on our valves

Ex. valve on #1 isn't closing – loss of compression and power.

Nelson brags RPM DELO Oil keeps his valves clean as a whistle.

Nelson says compounds in RPM DELO Diesel Engine Lubricating Oil keeps valves free 3 ways:

1. Anti-oxidant stops gum formation
2. Metal adherent keeps oil film on stem — prevents wear.
3. Detergent cleans away carbon deposits.

Mon. – lube change due – get RPM DELO Oil

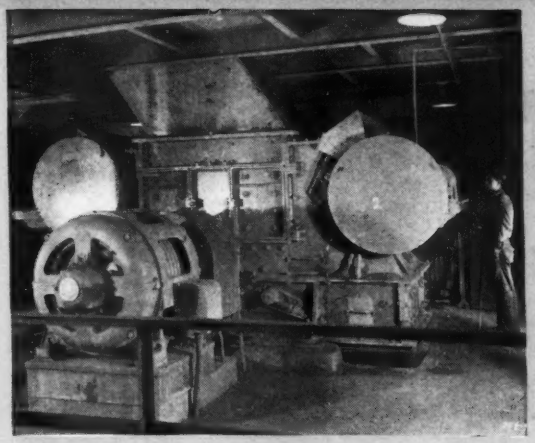
STANDARD OF CALIFORNIA • San Francisco, Calif.
THE CALIFORNIA COMPANY • Denver, Colo.
THE CALIFORNIA OIL COMPANY • New York
STANDARD OF TEXAS • El Paso, Texas

The Jeffrey belt conveyor contributes much to modern mechanical production on many metal and non-metallic properties. Note the photos at right and below... non-stop production, dependable movement of ores to preparation plant. You can rely upon Jeffrey belt conveyors for rapid delivery of material. Consult us first if you want a well-organized handling system.

TO HELP YOU HURDLE MOUNTING PRODUCTION COSTS

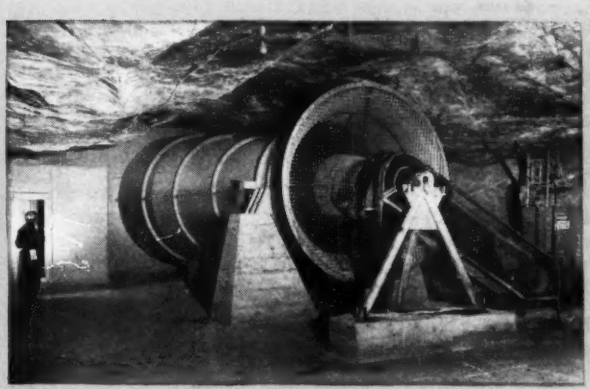
Upper left-opposite page — a Jeffrey 42" x 50" crusher installation in a large sintering and washing plant in Minnesota. A Jeffrey haulage type locomotive hauling a trip of mine cars in a metal mine operation may be seen at top right.

Next above is shown a Jeffrey-Traylor electric vibrating feeder (patented) discharging into a belt conveyor. This method of handling provides a continuous, uninterrupted flow of material from one operation to another. Right-above . . . a J-T electric vibrating grizzly feeder, capable of handling large tonnages. Right... A Jeffrey A-6 Post drill used in modern mining ...coal, metal and non-metallic. Send for literature.

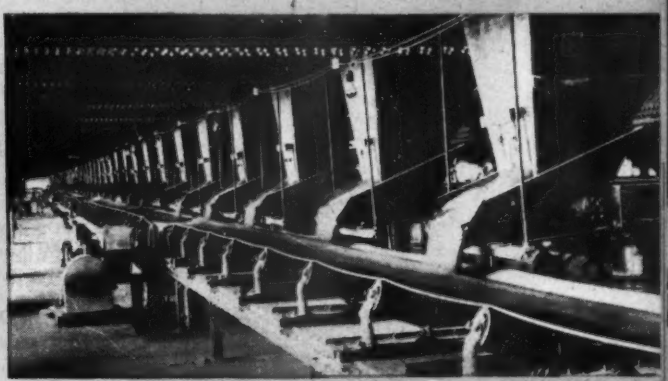


NOW, more than ever, the need is for equipment that will speed up processing and handling. We can help you . . . years of study of mining and material handling designs and applications enable Jeffrey to build equipment to meet all conditions. A few typical installations of this efficient equipment are shown. Consult Jeffrey engineers for specific data on how to reduce costs of operation and boost production . . . in mining, milling, smelting and refining.

Jeffrey Magnetic Separators (patented) are of the wet process type designed to effect a high and clean recovery of ore concentrates. One shown is operating in a large western concentrator.



This Jeffrey Aerodyne Fan (patented) is supplying fresh air to a large salt mine. This fan is available in single or double stage units for operation against mine pressures up to 8" and 16" water gauge.



A large battery of Jeffrey-Traylor electric vibrating feeders (patented) handling copper ore in a large South African plant. Here is feeding and conveying at its best. Send for our NEW J-T catalog No. 750 which goes into detail.

Whether your interest is in fans, feeders, conveyors, crushers, locomotives, drills or other Jeffrey equipment consult a Jeffrey engineer to help you determine the type and size best suited for your conditions.

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ESTABLISHED 1877

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Complete line of Material Handling, Processing and Mining Equipment

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Baltimore 1	Buffalo 2	Cleveland 13	Harlan	Jacksonville	Pittsburgh 22
Birmingham 3	Chicago 1	Denver 2	Houston 5	Milwaukee 2	St. Louis 3
Boston 16	Cincinnati 2	Detroit 13	Huntington 19	New York 7	Salt Lake City 1
				Philadelphia 3	Scranton 3

now LONGER pump life

LASTING efficiency

GARDNER-DENVER

VP4 SUMP PUMP

Here—at last—is a sump pump built especially to save costly delays on the job and frequent replacement expense! The new Gardner-Denver VP4 Sump Pump has TOP-SUCTION—won't dig in and bury itself in the mud. But that's only one of its big features . . .

TOP SUCTION—Top-suction design eliminates one of the most common causes of pump failure—breaking of the pump shaft seal because of water pressure. In the VP4, the oil seal is subjected only to static pressure from depth of immersion when not in operation—when pump operates, water *cannot* reach oil seal or air motor.

BETTER LUBRICATION—Built-in oiler lubricates all moving parts with oil. Oil chamber is one-quart capacity for 24 hours' normal operation. No grease fitting to be neglected and cause bearing failure.

LESS WEAR AND TEAR—Built-in governor idles the pump automatically when suction runs dry—saves air. Pump shaft and air motor each run in two oversize ball bearings.

HIGH EFFICIENCY—Operated by a powerful vane-type air motor, the VP4 is of the closed impeller type, with impeller screwed and locked to the pump shaft. Shim adjustment of the impeller and the chrome-plated wearing ring of the pump case assure full operating efficiency over a long period of time.

LONG LIFE IMPELLER—Cast of exceptionally hard, abrasion-resistant alloy.

SIMPLE CONSTRUCTION—Buttress thread cap on air end for quick disassembly instead of multiple cap screws, studs or bolts. Air inlet has non-clogging filter screen easily and quickly removable for cleaning.

EASY TO HANDLE—Light in weight, the VP4 has substantial handles welded to the housing for greater ease in lifting and carrying.

For complete information write Gardner-Denver Company, Quincy, Illinois

GARDNER-DENVER SINCE 1859

How To Bring Down Two "Overheads" At Once

Drilling smoothly and easily into the hardest rock, this Blue Brute Stoper is cutting down maintenance costs at the same time. It's the new, self-rotating WR-31 — a fast, tireless performer that will do a lot of heavy drilling for you on very little air.

From end to end the WR-31 is crammed with new design improvements. For instance, the ratcheted rifle bar engages four air-operated pawls on the piston's backstroke. There's positive action here, with extra solid, longer lasting construction — and it's exclusively Worthington!

That proper position of the holding handle — *above* the centre of gravity for better balance — will make a big hit with your runners. They'll like the shielded, down-directed exhaust and the air and water tube construction which insures a constant air stream that keeps sludge and water out of the shielded type chuck.

Men who use stopers *know* stopers— and you'll save money by giving them equipment that combines easy handling with tops in efficiency. How about letting them get the "feel" of the new WR-31 in an easily arranged demonstration? Watching this speedy, economical Blue Brute in action will prove to you, that *there's more worth in a Blue Brute.*

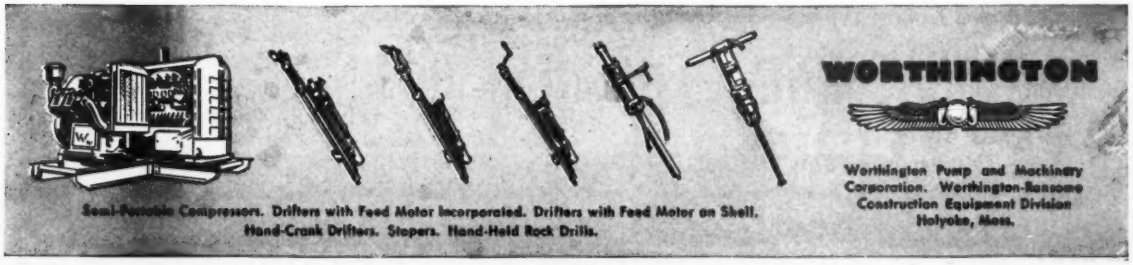
Write for literature describing the complete line of BLUE BRUTE Mining Equipment, including Drifters, Stopers and Hand Drills.

BLUE BRUTE DRIFTERS

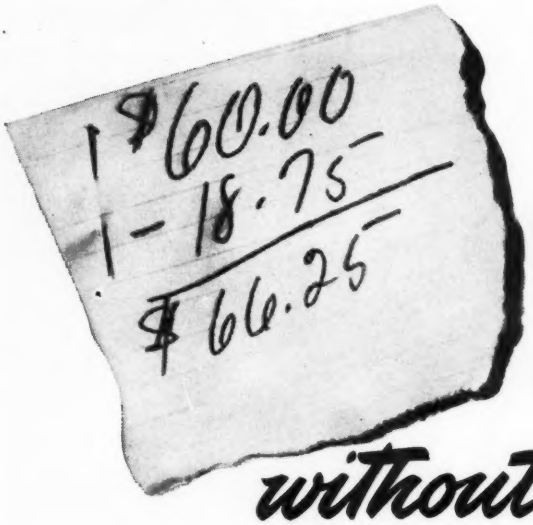
Types WPM (Pneu-Motor Incorporated in Drifter), WPMS (Pneu-Motor on Shell), and WHC (Hand Crank). Featuring the new, *balanced* design for faster drilling cycles and all-around operating economy.

Buy Blue Brutes

HD-11


WORTHINGTON
Worthington Pump and Machinery Corporation. Worthington-Ransome Construction Equipment Division Holyoke, Mass.

Semi-Portable Compressors. Drifters with Feed Motor Incorporated. Drifters with Feed Motor on Shell. Hand-Crank Drifters. Stopers. Hand-Held Rock Drills.



How 19,000 companies up take-home pay *without upping payrolls*

Can you deduct $18.75 from $60.00 and get $66.25? *Yes.* And the way you can do it is mighty important to your company—and to the nation!

You start with $60, representing someone's weekly take-home pay. You deduct $18.75 for the purchase of a U.S. Savings Bond. That leaves $41.25. But $41.25 isn't what the worker takes home. He takes home $41.25 *plus a $25 Savings Bond.* Total (assuming he holds the Bond till maturity): *$66.25.*

WHAT 19,000 COMPANIES HAVE LEARNED

In the 19,000 companies that are operating the Payroll Savings Plan for the regular purchase of Savings Bonds, employees have been more contented in their jobs—absenteeism has decreased—even accidents have been fewer!

Those are the "company" benefits the Plan provides, in addition to extra security for individual employees.

But the Plan has other, far-reaching benefits of basic importance to both your business and the national economy...

SPREADING THE NATIONAL DEBT HELPS SECURE YOUR FUTURE

The future of your business is closely dependent upon the future economy of your country. To a major extent, that future depends upon management of the public debt. Distribution of the debt as widely as possible among the people of the nation will result in the greatest good for all.

How that works is clearly and briefly described in the free brochure shown at the right. Request your copy—*today*—from your State Director of the U. S. Treasury Department's Savings Bonds Division.

ACTION BY TOP MANAGEMENT NEEDED

The benefits of regular Bond-buying are as important today as ever—but war-time emotional appeals are gone. Sponsorship of the Payroll Savings Plan by a responsible executive in your company is necessary to keep its benefits *advertised to your employees.*

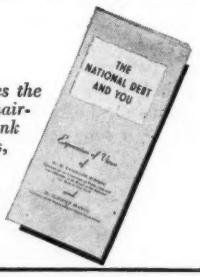
Banks don't sell Savings Bonds on the "installment plan"—which is the way most workers prefer to buy them. *Such workers want and need the Payroll Savings Plan.*

Those are the reasons why it's important to make sure that the Plan is adequately maintained in your company.

The State Director will gladly give you any assistance you wish.

"The National Debt and You,"

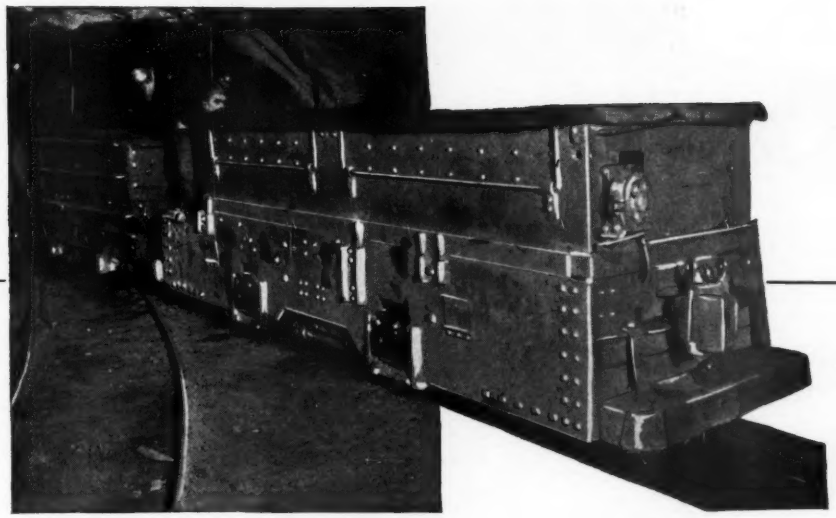
a 12-page pocket-size brochure, expresses the views of W. Randolph Burgess, Vice Chairman of the Board of the National City Bank of New York—and of Clarence Francis, Chairman of the Board, General Foods Corporation. Be sure to get your copy from the Treasury Department's State Director, Savings Bonds Division.



The Treasury Department acknowledges with appreciation the publication of this message by

MINING CONGRESS JOURNAL

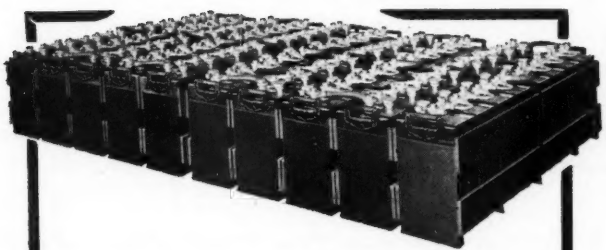
This is an official U.S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council



Do you get...

EXTRA SERVICE from "retired" Batteries?

After an EDISON Nickel-Iron-Alkaline Battery has delivered its normal service life in a locomotive or shuttle car and has to be replaced because the battery is no longer of sufficient capacity for the work, its cells, instead of being scrapped, are often regrouped into other batteries for lighter-duty uses for which their capacity is still ample.



In Mine Locomotive and Shuttle Cars EDISON Nickel-Iron-Alkaline Batteries Give You These Important Advantages

★ They are **durable mechanically;** grids, containers and other structural parts of the cells are of steel; the alkaline electrolyte is a preservative of steel.

★ They are **foolproof electrically;** are not injured by short-circuiting, reverse charging or similar accidents; are free from self-deteriorating reactions.

★ They can be **charged rapidly;** do not require critical adjustment of charge rates; can be charged directly from mine d-c supply.

★ They **withstand temperature extremes;** are free from freezing hazard; are easily ventilated for rapid cooling.

★ They can **stand idle indefinitely** without injury. Merely discharge, short circuit, and store in a clean, dry place.

★ They are **simple and easy to maintain.**

FREE ADDITIONAL POWER ——

The electrical departments of a number of mines have been doing just that; in effect getting new batteries free which, in various stand-by jobs, often give many more years of dependable performance. The fact that nickel-iron-alkaline batteries can do this is a good illustration of their unequalled dependability on the original job.

The reasons are few and simple: steel cell construction; an alkaline electrolyte that is a natural preservative of steel; a principle of operation free from self-destructive reactions. Because of their long life, simple maintenance, and trouble-free characteristics, EDISON Nickel-Iron-Alkaline Batteries also help cut haulage costs. ***Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J. In Canada: International Equipment Company, Limited, Montreal and Toronto.***

EDISON

Nickel • Iron • Alkaline

STORAGE BATTERIES

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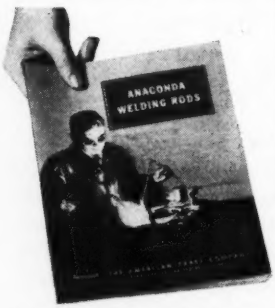

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Mining CONGRESS JOURNAL

Published for the Entire Mining Industry by The American Mining Congress

SHELDON P. WIMPFEN, Editor

Volume 34 JANUARY, 1948 Number 1

NOW IS THE TIME!

FOR nearly ten years, since the passage of the Fair Labor Standards Act, commonly known as the Wage-Hour Act, industry in general and mining in particular have been attempting to fill the Nation's requirements, for raw materials and capital and consumer goods, under a serious handicap. The law's artificial restrictions on working time, together with its unrealistic administration, have seriously hampered production.

A Congress in the depths of a recession, faced with the prospect of large unemployment, passed the Wage-Hour Act. It had in mind, among other things, inducing employers to shorten the work week by making overtime work more costly, eliminating "sweat-shop" conditions in the production of goods for interstate commerce by requiring a minimum wage, and the regulation of child labor. Aside from the basic undesirability, from a national viewpoint, of legislating unemployment for workers whose services may not be worth the minimum wage set by Government decree, we are particularly concerned with the maximum hour provisions of the FLSA.

One purpose of the Act was to "spread the work" by penalizing employers through requiring payment of one and one-half times the "regular rate of pay" for hours in excess of 40 in any work week.

Varied interpretations of what constitutes "regular rate of pay" have made it impractical for employers to make certain payments desirable to employes. Incentive and bonus payments, recognized in many sections of the mining industry as an efficient and satisfactory means of compensating for increased productivity, must be added, under the interpretations of the Act, to the agreed base rate of pay in arriving at the so-called "regular rate of pay" upon which overtime payments must then be computed. The higher costs thus entailed, and to an even greater extent the uncertainties in determining costs, may force the abandonment or prevent the establishment of incentive plans which would increase production and earning power.

A similarly perplexing situation harasses mine operators in Alaska and in isolated regions of the United States where board and lodging have traditionally been paid by the employer, and where, due to employe preference, a six or seven-day work week prevails during the working season. The frequently uncertain food cost must be summed up with the contracted rate of pay as a basis for computation of the "regular rate of pay." As a result, in addition to time and one-half, an employe is also paid board and one-half—whatever that is—with Social Security taxes and withholding taxes computed on the total. Further uncertainty results if, as is often the case, actual board costs are later found to exceed the estimates used in making up pay-rolls, thus calling for retroactive adjustments on the overtime pay.

Unrealistic definitions such as those of "executives, administrative, and professional employes," "goods," and "necessary to production," impose further burdens on industry and hinder production. Clear-cut definitions of those types of employes exempt from the maximum hours provisions should be set forth *in the Act* and not left to the discretion of the Administrator. The definitions of "supervisors" and "professional employes" recently adopted in the Taft-Hartley Act—which reflect primarily the functions and duties performed by the particular employes and do not call for a minimum amount of "non-exempt work"—would adequately serve this purpose.

Mine office workers have been historically responsible for completion of specified duties over a month's time rather than in a single week. But their inclusion in the coverage of the Act has tended to make clock-watchers and complaining workers out of many alert, ambitious young men who formerly were interested in doing a job to the best of their ability. Curtailment of the individual's right to work and to gain new skills and knowledge has acted to reduce opportunities.

Had the 75th Congress anticipated World War II, Selective Service, Lend-Lease, an enormous national debt, labor and material shortages, and a dominant need for more production, it is extremely doubtful that a law to "spread the work" would have passed. It was not adequately realized that the Wage-Hour Act and its numerous technical interpretations, subject to constant change by administrative and court rulings, would have such an adverse effect upon industry.

The original intent, that time and one-half compensation be paid on an agreed hourly rate, has been distorted. A number of concrete proposals have been made that would lead us forward to the solution of present difficulties.

It has been suggested, with good logic, that the work week at regular rate should be lengthened to 48 hours to make possible the high production called for today. Another sound recommendation is that the law itself require simply that payment for overtime be at not less than one and one-half times the *minimum statutory hourly rate,* leaving employers and employes free to set actual overtime rates by the established processes of collective bargaining. Such a realistic provision would wipe out, at a single stroke, a majority of the complexities and uncertainties now created by the law.

Passage of the Taft-Hartley Act in the first session of the 80th Congress came in response to a popular demand for relief from the abuses which had developed under the Wagner Act. Relief from the artificial restrictions of the Fair Labor Standards Act will improve this Nation's ability to produce, help to curb the tide of inflation, and invigorate the American system of mass production, fair prices, and high wages.

Mechanization for Greater Productivity and Lower Costs

Mechanical Loaders increase the speed of shrinkage stope preparation at Copper Canyon Mining Co., Battle Mountain, Nev.

Here an Eminent Authority on Mechanization Reviews Past Progress in the Field and Points Out Opportunities for the Industry to Apply Available Equipment and Methods of Mechanization in Increasing Efficiency

★

By L. E. YOUNG

Consulting Mining Engineer
Pittsburgh, Pa.

★

MECHANIZATION for greater productivity and lower cost is a subject that is demanding more and more attention from the metal mining industry.

Underground Mining

It has been suggested that the discussion be limited to underground mining of ores and industrial minerals. Generalizations on underground mining practice are usually ill-advised and impractical on account of the great differences in the extent, shape, etc., of orebodies and in the physical characteristics of ores and rocks. The problems of mining soft iron ores of the Lake Superior region and of the soft, wet bauxite ores of Arkansas are much different from the mining problems of Climax, Butte, and Bisbee. The mining conditions in the Tri-State District, the Carlsbad Potash Field, the Birmingham Iron District, and the Coeur d'Alene District present a variety of problems. However, there are certain phases of mechanization programs which are of general interest, and an effort will be made to review recent progress and to indicate some of the fields in which research work is being done with some promise of success.

It is commendable that throughout the entire mining industry the postwar mining problems have been met with vigorous programs by engineers and operators. The mining practice and the mine equipment have been adapted to the type of ore deposit and to existing mining conditions.

The discussion of underground mechanization will be concerned with drilling, loading, and transportation practices, the new types of equipment

recently installed and being developed, and the possible effective results when such equipment is used.

Necessity for Increased Mechanization

With increasing wages rates, shortage of labor for underground operations, and the exhausting of the shallower and, in many instances, the higher-grade mineral deposits, there is urgent need for greater tonnage of ore per man-shift, improved productivity, and lower costs per unit of output, whether it be precious metal, copper, lead, zinc, iron, limestone, gypsum, or bauxite.

Some of the same problems must be faced in many of such operations, much of the same design of tools and equipment may be used in a diversity of mines, and the increased and efficient use of power offers corresponding advantages in most mining districts.

In any review of mine mechanization the essential factors affecting costs are:

(1) operating labor, supplies, and power.

(2) maintenance labor and supplies.

(3) depreciation charges on equipment added to reduce the labor and increase productivity.

(4) safety of workmen and charges incident to reducing any hazards growing out of mechanization, and

(5) the effective use of men, machinery, and working places. It must be emphasized that productivity of the drift, stope, or level during all of the shifts of the day is a factor that deserves most serious consideration.

Objectives and Present Trends

The importance of each of these items is so obvious that detailed discussion of them is unnecessary but specific objectives that may be considered essential to progress in the field of mechanization should be emphasized. Among these objectives, the following may be cited as of prime importance:

1. Reducing the effort of labor by so-called "labor-saving" devices.
2. Effective use of power wherever possible instead of manual labor.
3. Eliminating delays and saving the time of workmen.
4. Installing continuous or concurrent operations wherever it is practical.
5. Eliminating (or reducing) excessive travel or movement, during the shift, of men and equipment.

While it is assumed that first consideration must be given to labor cost, it is not recognized generally what the trends have been in the last 15 to 20 years in certain of the other factors that enter into mining cost, namely:

1. Cost of electricity per KWH,
2. Cost of explosives per pound and per ton of ore broken,
3. The prevailing interest rate or cost of money to finance mechanical improvements, and
4. The increased rate of rock drilling, which may be taken as an index of technologic advance.

While the hourly wage rate of miners has increased over 100 per cent in the last ten years, in contrast

1. The cost of electricity for industrial power has decreased from 5 to 10 per cent per KWH.
2. The cost per pound of explosives has increased in the last year, but over a period of years, due to the improvement in the quality of explosives, the cost of explosives per ton of ore or rock broken has increased but little.
3. In the last 15 years the rate of interest on industrial loans has decreased at least one-third, thereby reducing somewhat the carrying charges on mine and plant improvements.

These facts are cited in order to emphasize the necessity for increasing productivity per man employed underground.

Maximum production is obtained by slusher loading trains directly from scram drifts

Equipment for moving loaders meets special condition of soft bottom or great distance between working places

Increased Power per Employe

A recent survey of the use of electric power in representative mining districts shows, in general, a continuous increase in power per man employed, per ton of ore produced, and per unit of product, after making due allowance for increased depth of mining, increased length of haulage, and greater power requirements for ventilation and pumping.

In one large district, the connected horsepower per man employed has increased 30 per cent in ten years, while the KWH per man employed has increased 50 per cent. This corresponds with the experience in bituminous coal mining. There has been an increase of more than 100 per cent in the connected load in the working sections that have been mechanized and an overall increase of 50 per cent in the KWH required per ton produced. A comprehensive survey has been made by the West Virgina Engineering Company, which has kindly consented to the use of the data at this meeting. At a representative small mine using conveyors, the KWH per man employed has almost doubled since the mine was mechanized; while at another mine where the change was from hand-loading to 50 per cent mechanical loading, the KWH per ton increased 50 per cent and the KWH per man employed increased by 150 per cent. At a completely mechanized mine, the KWH per man employed is double what it was when the coal was loaded by hand.

Increased Capital per Employe

A significant development is the greatly increased capital requirement when mines are mechanized. As an illustration, if a small crew of men who contract to drive laterals, drifts, and crosscuts are furnished with the necessary equipment to carry on the work efficiently, including drills, drill carriage, mucking machine, mine cars, locomotive, fan, and tools, this equipment usually represents an investment of from $5,000 to $8,000 per man. In mechanized coal mines the investment per face employe for mechanical loading devices is usually large. In some of the completely mechanized mines in stratified mineral deposits, the investment per employe for loading machines and all equipment on the section, exclusive of locomotives, mine cars and track, is more than $7,000 (on the basis of single-shifting the equipment).

Important Progress

In reviewing briefly the progress that has been made, we may group the most important subjects under the following headings:

1. Shaft and slope sinking.
2. Drifting and tunneling.
3. Stoping.

Under each of these headings we may consider:

a. Drilling.
b. Mechanical loading devices.
c. Transportation equipment, and
d. Miscellaneous services.

It is impractical to present an historical review of the progress made in developing and applying machinery in each of these divisions of mining work. The recent progress in most of these fields has been discussed at length in the technical press and in meetings of operating officials and engineers. Illustrations will be presented to show some of the most interesting applications.

1. Important improvements have been made in drills, drill-bits, drill-steel, both for percussive and rotary drilling. Notable progress has been made in detachable rock-drill bits, the use of special steels, and the application of diamond and other rotary bits.

The increasing use of special mountings for drills, including jumbos, wagons, etc., has been most important. There has been real progress in reducing the severe labor in handling and moving drills and drill mountings. This has been true for drilling in open stopes, timbered stopes, drifts and tunnels. In case of light-weight units with two drills, the jumbo may be mounted on skids and pulled about by the slusher hoist. It may be of advantage to mount the jumbo on a truck to run on rails, on caterpillars, or on rubber tires.

As a result of improved drill-bits and drill-steels, it has been possible to increase the speed of drilling, re-

Rotary dumps enable rapid unloading of trains without uncoupling cars

duce the number of changes, and increase the total length of feed. Such improvements have warranted the mountings of the drills on jibs or booms. In some instances, the booms may be moved by a small hoist; while in others, hydraulic power is used effectively to position the boom or jib. Such improvements in drills, drill carriages, and drill mountings have made it possible to drill faster, to drill deeper holes, to place holes more effectively, and to improve fragmentation for mechanical loading.

Typical of the progress made in the effort to expedite drilling in drifts and stopes is the work that has been done in the Coeur d'Alene District. Recently, R. S. Hooper, assistant mine superintendent of Bunker Hill and Sullivan Mining and Concentrating Co., reviewed the improvements made (A.I.M.E., T.P. No. 2256), as follows:

(1) The development of a light, flexible, easily transported jumbo equipped with two pneumatic columns.

(2) Automatic-feed drilling machines with detachable bits.

(3) For shaft sinking up to 50°, pneumatic columns have been adapted to use power-feed drifter drills and raises up to 41° are driven with this same type of equipment, and

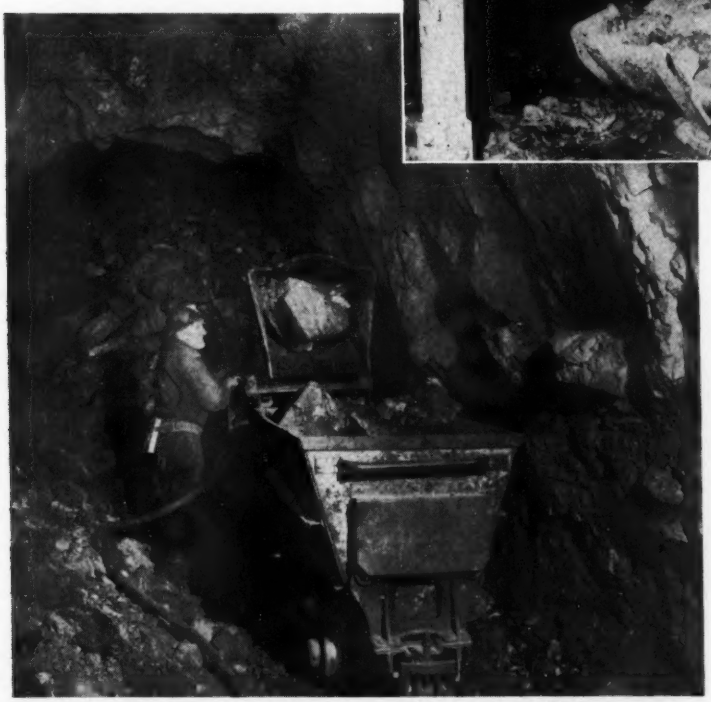
(4) Pneumatic columns are used extensively in stoping operations.

2. Mechanical loading devices, including scrapers, mucking machines, mobile loaders of various sizes and conveyors (used in connection with scrapers and loaders) are being improved continually and their application has been made more effective. While scrapers or slushers have been used extensively for many years, there have been improvements in equipment which have made its use more effective. Among these may be cited the development of light-weight portable units for use in stopes and portable slusher ramps.

The small mucking machine continues to be used to advantage in drifts, tunnels, and stopes, and recently has been employed in sinking slopes. In large stopes and in beds where the floor is practically flat, there has been increasing use of several types of shovels and loaders. Mechanical loading cannot be discussed without at the same time giving consideration to the facilities required to transport the ore away from the working place.

3. In order to make it possible to move large tonnages from loading machines or scrapers, it is essential that rugged cars or trucks designed for the service to be used. The capacity and design of effective cars, trucks, or shuttle cars, depends on the character and size of material to be loaded, the dimensions of the haulage entry, the grade of the haulage road, the length of haul, facilities for unloading the transporting unit, etc. There is such a diversity of haulage units in service that detailed comment on any one type would not be timely. The size of cars running on tracks varies from the standard car holding 1.5 to 2 tons of ore to eight-wheel cars holding more than 10 tons. The rubber-tired diesel trucks may hold as much as 18 tons, while the electric-powered, self-unloading shuttle cars hold six to 15 tons, depending on the specific gravity of the material hauled.

Swivel-equipped shaker conveyor permits deflecting loading unit over a broad face in a New York State gypsum mine



Lead ore from shrinkage stope at Darwin Mines, Darwin, Calif., moves fast with a rocker shovel

For some time shaker conveyors have been used successfully to transport copper and iron ore from chutes. In some instances these shakers discharge onto belts which deliver the ore to pockets, chutes, or other belt conveyors.

There has been increasing interest in haulage by belt conveyors from producing sections to the shaft bottom and much attention has been given to the possibility of installing belts in slopes constructed as haulage ways. In metal mining, as well as coal mining, there appear to be substantial economies in this latter type of installation where there is sufficient daily production and reserve tonnage to warrant the investment.

As a result of the improvements made in driving slopes on a 15° to 18° pitch, with a corresponding reduction in the cost of construction, belt conveyors are being used instead of hoisting in vertical shafts or slopes.

In this connection it should also be pointed out that considerable progress has been made in mechanizing shaft and slope sinking. Special boring tools have been used for some years and large cores have been taken successfully from both shallow and deep vertical shafts. Several comprehensive papers have been presented describing successful sinking of shafts by boring. There is increasing interest in the coal fields in putting down circular shafts for ventilation and escapeways; it is now possible to bore shafts about 6 feet in diameter from the surface to depths of 400 feet and more. In a number of instances where connections are to be made from the surface to an existing mine opening, or from one level to a lower level, holes are being drilled downward and then enlarged by reaming or blasting, the muck being handled from the lower level. Mechanical mucking and special facilities to expedite drilling in shafts have been important steps in improving shaft-sinking practice.

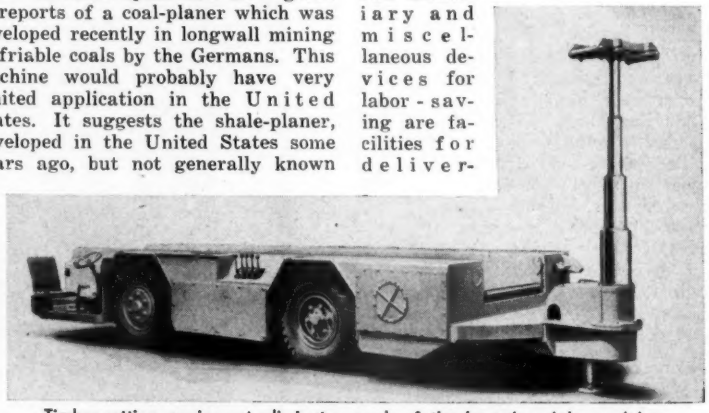
In inclined shafts and slopes, mucking machines and other types of loaders have been adapted to the particular problem in a number of instances, often by supporting the machine by means of ropes or chains and a counterbalance. In slopes where belt conveyors are to be installed and the grade is 15° to 18°, standard loading machines, working on the full grade, are being used successfully to load into cars, trucks or conveyors.

The driving of large tunnels and drifts with mucking machines and mechanical loading devices has been practiced for many years, in fact the earliest types of rock-loading machines were developed in order to improve the rate of advancing tunnels. Many efforts were made to produce a tunnelling machine that would remove rock without blasting, but none of these succeeded. Much thought is being given to the development of combination cutting-and-loading machines that will advance horizontal openings in such materials as shale, chalk and coal. A continuous entry-driving machine has been in use in coal mining for some years; while this machine is suitable for entry-driving, it has limitations in its application to driving rooms, etc. Recently, announcement has been made that a combination cutting-and-loading machine for coal will soon be placed on the market. This machine will advance a standard entry in coal about 100 ft. per shift. As now designed, this machine would not lend itself to driving entries in hard rock.

Considerable space has been given to reports of a coal-planer which was developed recently in longwall mining of friable coals by the Germans. This machine would probably have very limited application in the United States. It suggests the shale-planer, developed in the United States some years ago, but not generally known to the mining fraternity. This machine is now used successfully in mining shale in open-pit workings. It is mentioned in this connection because the principle involved in the design and operation of this machine may be of interest to anyone working thick beds of material that can be cut by a chain-cutter. It consists of a heavy chain with cutters, operating in a vertical plane and mounted on a turntable supported by caterpillars. The cutter can remove an entire 80-foot wall on an arc-face 42 feet in diameter at the bottom, with the wall sloping backward from 12½° to 25°. The machine is advanced slowly on the cats, usually with a depth of cut of one-half inch.

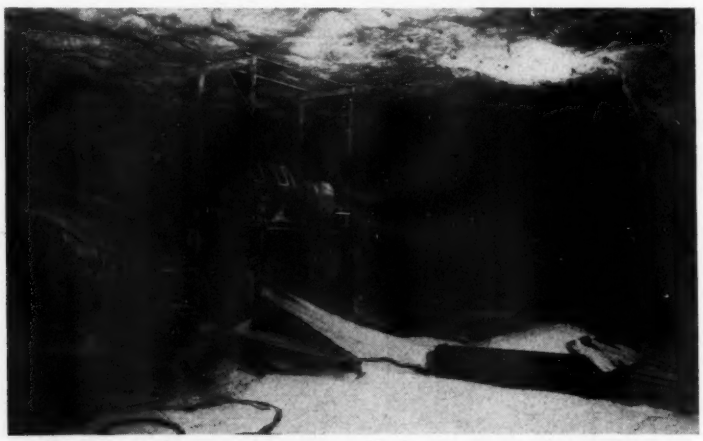
The loosened material falls to the floor and is picked up by a conveyor which discharges into trucks or cars. This mechanical principle may find application in room-and-pillar mining in thick beds of relatively soft material.

In various ways improvements are being made to reduce or eliminate severe manual labor, to expedite the handling of supplies and materials, and to save the time of men. Among the auxiliary and miscellaneous devices for labor-saving are facilities for delivering supplies and equipment to working places, such as stopes, raises, etc. In mines where heavy timber must be set regularly, devices have been perfected to lift heavy timber to place and hold it securely while posts or stulls are prepared and placed. This equipment is used also for handling heavy steel supports.



Timber-setting equipment eliminates much of the hazard and heavy labor from timbering

In mining stratified deposits, various effort-saving machines and auxiliary equipment have been perfected, such as trucks to move heavy equipment, special cars for mechanics, units to facilitate lubrication of equipment, equipment for salvaging rails, timber, etc.



Tread-mounted, ramp and scraper combination improves loading methods at New Iberia, La.

Review of Present Status

A number of different types of mechanical loading devices have been in service for years, improvements are being made constantly, and new designs are being perfected. In general, the success of such equipment depends on the existing conditions in the mine, rather than on the mechanical features of the machines. In a number of instances, new mines are planned to take advantage of the available machinery. These recent mining pro-

grams have been reviewed from time to time in the technical press and most of them need not be described in detail.

One of the most important factors in mechanical loading is what may be called the loadability of the material after it has been broken by blasting or caving. Where ore or rock is drilled and blasted, the size of the largest pieces, the hardness and abrasiveness of the material, and the necessity for secondary blasting play an important part in determining the rate of loading by the machine and the cost of mechanical maintenance.

The recent improvements in drilling and blasting practice have done much to improve fragmentation. The use of jumbos, with a corresponding reduction in the labor cost of drilling, has justified the drilling of a few additional holes in order to use explosives most effectively and to improve fragmentation. Frequently, a small additional expenditure for drilling and explosives may result in a substantial reduction in the cost of loading and in the maintenance of the loading equipment.

Only brief mention will be made here of the relationship between mechanical loading and haulage (mass production) of lower grade material, instead of selective mining. In certain bituminous coal mining districts, where there are impurities in the coal seam or where there may be a stratum of overlying material that is difficult to support, it has been found desirable to load the impurities with the coal and remove the impurities and extraneous material in cleaning plants located on the surface. As much as 30 to 35 per cent of the material that is loaded may be discarded in cleaning plants. Inasmuch as it is necessary to put the coal through a cleaning plant in any event, it has been found economical to take full advantage of mass-production methods in mining and underground transportation, and build a larger cleaning plant that would be necessary when an effort is made to keep some of the refuse underground. Mass production methods may be feasible and economical in more underground mines, if appropriate concentration and preparation plants are available on the surface.

Potentialities

It is most difficult to make a general statement regarding possible improvements in mechanization that will be important in reducing costs and the sole purpose in venturing suggestions is to stimulate discussion. Logical development of mechanical loading will come by the intelligent application in mining of progressive practices in other industries. Obvious steps include:

1. Increasing use of power and power tools.

2. Improvement in the design, reliability, mobility, and performance of machines.

3. Improved quality of material used in machines, tools, equipment, etc., such as drills, drill-steel, drill-bits, conveyors, motors, etc.

4. Better wearing metals and alloys in scrapers, conveyors, etc.

5. Lighter metals and alloys in some of the mobile and portable equipment.

Progress should be expected as follows:

1. Continuing improvement in rock drills, drill-steels, drill-bits, drill-mountings, jumbos, etc. This should contribute to further economies in drifting, tunneling, and stoping on the basis of man-power employed per foot of advance and per ton of ore mined.

2. Continuing improvement is to be expected in all types of mechanical loading devices, including scrapers and hoists, small mucking machines, larger loaders mounted on track or caterpillars, and large shovels.

3. With improved fragmentation of the material to be loaded, it should be possible to improve the rate of loading and to expedite transportation. If large tonnage is made available at one point or in one area, and if fragmentation is sufficient, belt or shaker conveyors may be used to transport ore to the mill-hole, shaft, or slope. If fragmentation is not suitable for conveyors, the ore may be drawn from chutes or mill-holes, or scraped to rubber-tired shuttle cars, which haul the ore as much as 1,000 feet, to the shaft or slope. Improvements in conveyors, trucks and shuttle cars are probable.

4. Continuing improvement of mechanical mucking in shaft and slope work may be expected.

5. As the technique of putting down slopes improves and the strength of conveyor belts increases, it is probable that there will be much greater use of slope transportation, replacing hoisting in vertical shafts.

6. If powder smoke is removed promptly, more intensive use should be made of drills, jumbos, loading machines, and haulage equipment. This should permit improvements in mining methods.

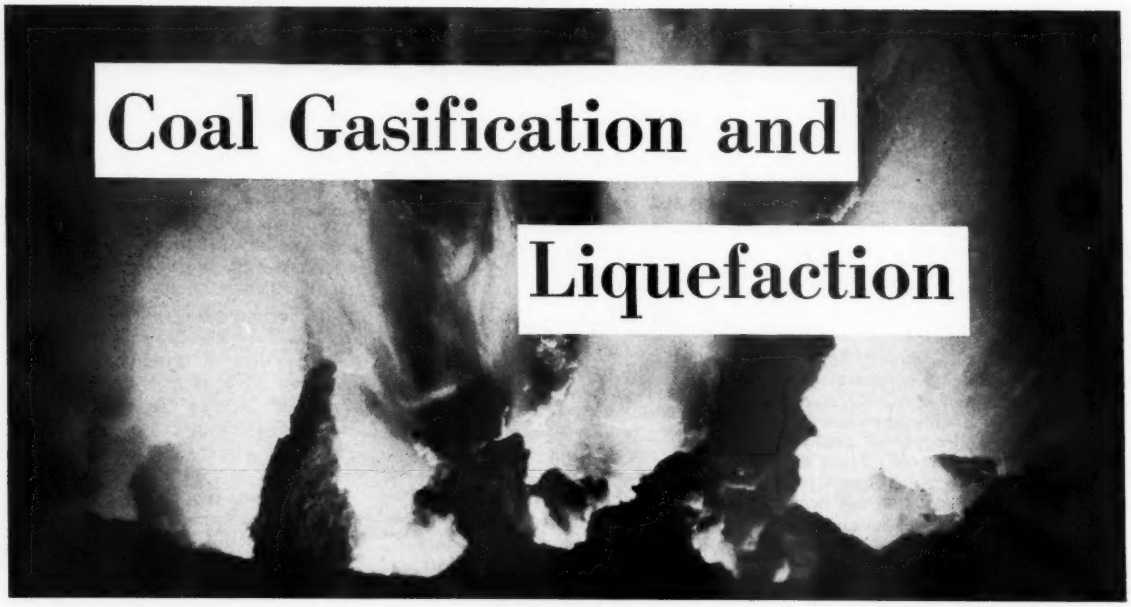
7. The increasing use of Diesel engines in European mines has attracted the attention of American engineers and the more extended introduction of Diesel trucks, locomotives, and loading machines may be expected.

8. With greatly improved steel for drills and cutting tools, it may be worthwhile to review the experiments of the period from 1900 to 1910 in the building of tunneling machines, particularly for non-metallic mining.

9. As mining methods are revised, it should be possible to design or adapt machines and equipment to suit the new conditions. Specific examples of current trends and possibilities are, (1) the development of a Diesel-powered loader for working heights of about 15 feet to load large Diesel trucks effectively, (2) the redesign of machinery built originally for coal mines so as to be effective in handling rock, (3) the design of scraping the equipment to secure more efficiency for longer hauls, and (4) the design of conveyors to transport ore long distances at low cost.

Continuing research, particularly under operating conditions, should point the way to further improvements in production.

Adoption of shuttle-cars and conveyor loaders to ore production results in greater productivity



Coal Gasification and Liquefaction

Will Coal Help to Meet the Future Needs for Gas and Oil Through the Extension of Synthetic Processes Now Under Development?

By JOSEPH PURSGLOVE, Jr.
Vice President
Research and Development
Pittsburgh Consolidation Coal Company

FUEL for comfort, and fuel for energy to drive the wheels of industry are subjects of genuine public interest today. Had there been the need for striking evidence of this interest in our country's fuel and energy picture, that evidence clearly was to be seen in the nationwide, in fact worldwide, reaction to a joint announcement made last March by Pittsburgh Consolidation and Standard Oil Development Company. This announcement told of our research plans in the field of coal gasification and liquefaction.

Any analysis of the present and prospective fuel and energy picture in this country entails an examination of the broad front along which the demand is expanding. Such an analysis furnishes logic in the framing of a question which, if suggested only a few years ago, would have sounded strange indeed. That question is this:

Aren't we in the coal industry, together with those who comprise the gas industry, and all the oil interests of the country, faced with the need, in the public interest, of finding common ground on which we can work together? While I am aware of the difficulties involved, I believe that such cooperation offers the only real means by which that very important job of meeting the overall fuel and energy needs of the country can be accomplished. Let me say that the result of investigations my company has made of this situation was a factor in formulating plans for research into converting coal into other usable forms of fuel, or energy.

Because these plans involved committing my company to expenditures for research heretofore considered by coal industry standards as something akin to colossal, it was expected that lively interest would be shown by our stockholders and directors. The broad general interest, however, and the manner in which this was expressed, indicate to me that serious thought is warranted by all of us in the business of supplying fuel and energy as to how these growing requirements are to be met in the future. And, by future, I refer to a period of time that is about as close as tomorrow.

Can Natural Oil Production Supply Future Demands

Let us take a brief look at conditions in the oil industry affecting present and future supply. At the peak of the wartime demand for oil, which occurred during the first three months of 1945, United States oil consumption for military, civilian and lend-lease purposes reached an all time high figure of 5,358,000 barrels a day. From many authoritative sources at that time came confident pronouncements that with the return of peace, this demand would taper off to some reasonable pre-war level.

Today, however, in the face of unprecedented production and refinery activity, the oil industry is making a Herculean effort to meet a demand that has spiraled to average daily consumption of more than 5,870,000 barrels in the first three months of 1947—or a gain in average daily consumption of more than 500,000 barrels. It is estimated that the oil consumption for the first three months of 1948 will average 6,220,000 barrels a day, or approaching 1,000,000 barrels a day *more* than the daily average peak of wartime consumption in 1945.

It is not difficult to see that the demand for gasoline dispensed from service station pumps is increasing. More and more automobiles are swarming onto the streets and highways each day and trucks are being driven farther and farther. This demand is not likely to decrease in the foreseeable future. Also, a constantly greater use of trucks for freight handling can be expected to develop, so the oil production to meet motor freight needs

(Extract of an address presented to the American Gas Association at Cleveland, Ohio, October 8, 1947.)

for gasoline cannot at this time be termed a temporary phenomenon. More and more Diesel locomotives are going to work on the railroads. The expanded use of oil for this purpose and conversion to oil burners for homeheating, accounts for a reported increase in light oil consumption of more than 65 per cent over the 1941 figure. Finally, there is the present-day very sizable consumption of gasoline and lubricating oils used by the airplane industry as against a much smaller volume used in the prewar years.

Almost daily we read of claims and counterclaims on crude oil reserves. In spite of this controversy, most oil men agree that the present market price of crude oil is below replacement costs. One report on the matter summed it up this way: "Despite greater exploratory effort, increased and deeper drilling and improved technology, the estimates of reserves found each year are less than the annual civilian consumption." This may be too severe a statement, as surveys indicate that oil reserves for the past three years are just about holding their own, but even so, the oil situation, combined with a somewhat similar condition in the natural gas industry, provides some basis for understanding the unusual interest being evidenced in the possibility of making gaseous and liquid fuels out of coal.

Research and Pilot Plants

First, I wish to make it clear that there is nothing new in the idea of making oil from coal. The experiments by Bergius of Germany on the hydrogenation of coal into oil date back to about 1910. Various experiments and processes for distilling oil from coal go back to the middle of the 19th Century. In fact, the coal oil that started to replace whale oil for lamps was just that, oil from coal, until after the advent of natural petroleum, when coal oil then became a name for kerosene. Many oils from coal plants were in operation in Germany and one large one in England before World War II, but all these produced gasoline and oils at a cost several times greater than they can be produced from petroleum.

Several groups and companies in the United States, for several years, have been working on the catalytic reaction of carbon monoxide and hydrogen. Pittsburgh Consolidation's partner in this coal gasification pilot plant project, the Standard Oil Development Company, has operated a large-scale synthesis reactor pilot plant at Baton Rouge, La., for about three years. At this pilot plant, the raw material source is natural gas from the Louisiana fields. This natural gas is first broken down by partial burning into carbon monoxide and hydrogen. The carbon monoxide and hydrogen are then fed to the synthesis reactor where it forms into the same liquid and gaseous products I mentioned previously as being formed in the proposed synthesis reactor part of a coal refinery.

All of the pilot plant work that has been done on the synthesis reaction of carbon monoxide and hydrogen is finally maturing into commercial applications. A large plant is being built near Brownsville, Tex., for the conversion of natural gas into gasoline, fuel oils and alcohols. Standard Oil Company of Indiana has on the drawing board, I am told, plans for a similar plant in western Kansas. Several other oil companies are reported to be planning to build plants in Texas to convert natural gas into gasoline. We feel, therefore, that by the time we have perfected a practical and commercial process for converting coal directly into carbon monoxide and hydrogen, the synthesis reactor half of our proposed coal refinery will be completely developed and matured.

Planning for Future Research

What the future, that is, the long-time future, holds for an industry of this kind, only time can tell. What another great national emergency involving another global war would do in the way of foreshortening the time element required for the development of such an industry, can only be a guess. As for the thinking and planning of my own company today, we see before us an extensive program of research out of which we hope to obtain the knowledge of how to design a process that will work economically, and then to project this knowledge into the operation of the commercial plant. Even on this one plant basis, there are many problems, not the least of which is the matter of economics tied in with the fuel trends and energy patterns of the whole United States.

There are a few naturally fortunate advantages with which we will work in maturing our own particular project, as we see it. First is the fact that as the source material for a commercial coal refinery, there is available to us a large block of coal large enough to sustain the operations of the size plant we envision for a long period. Equally important, this tract of coal is close to a large metropolitan area which is highly industrialized and in which the need for additional supplies of gaseous and liquid fuels may be developing while we are maturing our processes and plans.

While these advantages are being fully weighed, it seems all too clear that they will not offset the all-important factor of costs in delivering btu's from such a plant to the consumer. All available means of projecting these costs at this stage of our development program, support the belief that high-btu gas could not be delivered into the mains of local gas companies at prices even close to those which now obtain for natural

Raw gasoline from hydrogenation of coal

gas from the Southwest. Thus, we must conclude that the real usefulness (as a supplier of high-btu gas) of our proposed program lies in having a plant sufficiently flexible in its operations that during summer months, for example, the bulk of the output would be converted into liquid fuels and in the winter months switched to the production of gas. If this arrangement can be perfected, and we hope it can, gas from the coal refinery would then be available to augment the supply of natural gas at a time when the demand is at a higher than average level. And, it would be available at a time and under conditions when the local gas companies could justify the much higher cost of the coal refinery gas. To design and build flexibility of operation involving major changes in plant operation into a large coal refinery presents a research and development program of considerable magnitude in its own right.

Small plant for coal liquefaction to oil

Coal Reserves Are a Vital Factor

I'd like to make further reference to the position of coal and to the part coal seems destined to play in the future energy picture. There is an element of inevitability in the future role of coal, if only because our nation is blessed with such large reserves of this solid fuel.

Realizing that all of us in the energy and fuel fields must first consider meeting the public need, it seems important that we be conscious of the related horizons of the varied fuel and energy industries. There is a relationship in our objectives of service, and there is a relationship in the problems that we must face and solve.

The future of the gas industry will not be easy sailing; the same is true of the oil industry. But just as it is true of gas and oil, so there are troubled waters ahead for coal, too. Important among these coal problems are the tremendously increasing capital costs and the ability of the industry to engage in long-range planning in the development of new production capacity in view of its past record of low earnings, if any.

The easily accessible coal deposits are being rapidly exhausted and new mines, to get into the deeper and otherwise more remote blocks of coal, are going to require much greater development costs. Mechanization of mining is now an absolute necessity, and it is a large factor in increasing the capital expenditures required for new mine development. To clarify this point, a coal operator at the end of World War I could open a new mine with a few thousand dollars in cash. In that period, it cost considerably less than one dollar per ton of annual capacity to get into the coal-producing business. It now costs five to six dollars per ton of annual capacity, and this assumes that you already own a large enough block of coal to give sufficient life to the property to warrant such huge initial investments. Moreover, the trend towards highly mechanized and costly coal-producing operations accentuates the need for large and well-placed tracts of coal reserves. This also is a factor for increasing capital costs. Understand that I'm talking of capital costs, and not production costs, because in the latter case there is still hope of reversing the trend through more efficient mining techniques and better national labor relations.

Coal, Gas and Oil Must Work Together

This matter of capital costs brings us to a consideration of financial health, not only for the coal industry, but for the entire fuel and energy field. Just as the gas and oil industries are dependent on public capital and public regard, so coal is increasingly dependent on public goodwill and financial acceptance. The good financial health of a single element of the energy field is of benefit to the whole field. And beyond that, the financial health of the total energy field vitally affects the growth and soundness of our whole economy.

Hence, the need, in the public interest, of a common ground on which we can work together in the consideration of the broad energy problems. Hence, the need, in the public interest, of developing a new government concept of how this public interest can be better served through a cooperative attitude and relationships between coal, gas and oil as the major sources and suppliers of energy.

We cannot tell what the future will bring to us in the energy world. It may come to pass, for example, that coal will voluntarily yield to gas or oil in fields where gas and oil meet the need and still serve the broad aims of intelligent conservation and wise use. On the other hand, the time may come when gas, or oil, will have to decide whether there are not certain energy applications better served by coal, thus freeing increments of gas and oil to do a better job in other consuming fields, all to the end that the American consumer is served at less cost. In any event, we do know with reasonable assurance that the need for energy in all its forms will grow and all of us must grow if this need is to be met adequately and if we are to retain unfettered management of our roles in energy supply.

We believe the job of supplying this country's long-range energy requirements is too vast and complicated to be solved by any one group or combinations of companies in coal, oil, or gas. What, then, is the solution? I shall not undertake a specific and definite answer beyond the projection of these simple points: (1) the public need for fuel and energy must be a matter of first concern; (2) we should begin to view that need jointly, and (3) keep before us constantly the necessity for developing government understanding of the magnitude of the job and that it will need to encourage rather than damn cooperative efforts among those who are to meet the challenge of a growing, progressive nation.

The Taft-Hartley Act and The Mining Industry — *(Part II)*

Seven Problems of the Utmost Importance Remain to Be Solved by Comprehensive Labor Legislation. Decisive Action by Congress Would Rectify These Conditions Detrimental to Good Labor-Management Relations

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THE major problems enumerated in the December issue of MINING CONGRESS JOURNAL all directly affect the mining industry and are discussed in the order given.

Pre-Strike Vote

The first is the right of all the employes in a bargaining unit to vote on whether there shall be a strike or not, such an election to take place at the conclusion of bargaining and conciliation when the chips are down. It is not democratic to deny a minority participation in anything as important as a decision to strike or not to strike. The minority political representatives participate in the democratic processes of the legislature, and the minority representatives of employes should participate in bargaining. Furthermore, such elections would be a large factor in restoring to the rank and file in each local bargaining unit the right to bargain on their own terms and conditions of employment. *This is the opposite of industry-wide bargaining.*

Industry-Wide Bargaining

Industry-wide bargaining and industry-wide strikes are the second problem and are of particular concern to this industry because we have many employes who have to deal with a union under a leadership which is striving for industry-wide bargaining and is committed to industry-wide strikes. The industry-wide attempts at bargaining of that union have resulted in the international maneuvering of some of the local unions into surrendering their bargaining rights to the international executive board in Chicago.

Our experience shows that under such bargaining tactics, local problems and conditions are ignored by the International Union in executing its own grand strategies.

We want to bargain collectively, ourselves, with our own employes. We do not want our bargaining done for us by someone else a thousand miles away or a half a world away.

The Unions—A Law Unto Themselves

Concerning the third problem we believe that Congress should again make acts of unions which are illegal and in restraint of commerce subject to the Anti-trust Laws. The Sherman Act, passed in 1890, recognized as lawful peaceful picketing, peaceful persuasion and lawful strikes; but acts such as mass picketing, sympathy strikes, general strikes and secondary boycotts were proscribed as illegal and just as harmful to the free flow of commerce as any illegal marketing act. The labor unions vainly attempted to gain from Congress exemption for illegal acts. In 1940 the Supreme Court interpreted the law so as to give the unions such exemption and thereby permitted unions to become a law unto themselves. Since the passage of the Norris-LaGuardia Act and the Supreme Court decision, unions consider that force, violence and terrorism have at least received tacit approval of the government as legitimate union weapons, thus being given encouragements to break the law.

Use of Terrorism

The fourth problem is terrorism as a union weapon, one form of which is terroristic blockade of a plant, sometimes mistakenly referred to as picketing. It is more vicious and just as illegal as the sit-down strike, and its purpose is the same—to lock the plant by violence and deny the owner the use of his property and deny any

Less than 400 men handle ore and concentrates at the Morenci plant of the Phelps Dodge Corp. in the annual production of nearly 100,000 tons of copper

employe the right to work if he chooses to do so. You will remember that last year at the convention we heard Mr. Roy H. Glover, Western General Counsel, Anaconda Copper Mining Co., graphically describe to us the vandalism by "goon squads" and terrorism of workers' families and homes at Butte during the 1946 strike.

In the Senate debates it was admitted that the remedies provided under the Taft-Hartley Act to prevent mass picketing were inadequate. Certainly courts should be permitted on petition of injured parties to enjoin such illegal acts.

Compulsory Union Membership

The fifth problem, which became so aggravated that it demanded correction, was that of compulsory unionism. Over one-fourth of the states have prohibited compulsory union membership in any form. The Railway Labor Act prohibits compulsory union membership in any form on the railroads. The Taft-Hartley Act, however, permits compulsory union membership if 51 per cent of the employes vote to authorize it. This might permit 49 per cent of the employes to be forced to join a union against their will. Not a single man should be forced to join a union against his will, a fact recognized by President Roosevelt in the 1941 coal strike when he firmly said:

"It is also true that 95 per cent or more of the employes in those particular mines belong to the United Mine Workers Union. The Government will never compel this 5 per cent to join the union by Government decree. That would be too much like Hitler methods towards labor."

That compulsory union membership in any form should be prohibited is definitely shown to be the will of the people in every state which has balloted on the proposition.

The Employer's Right to Manage

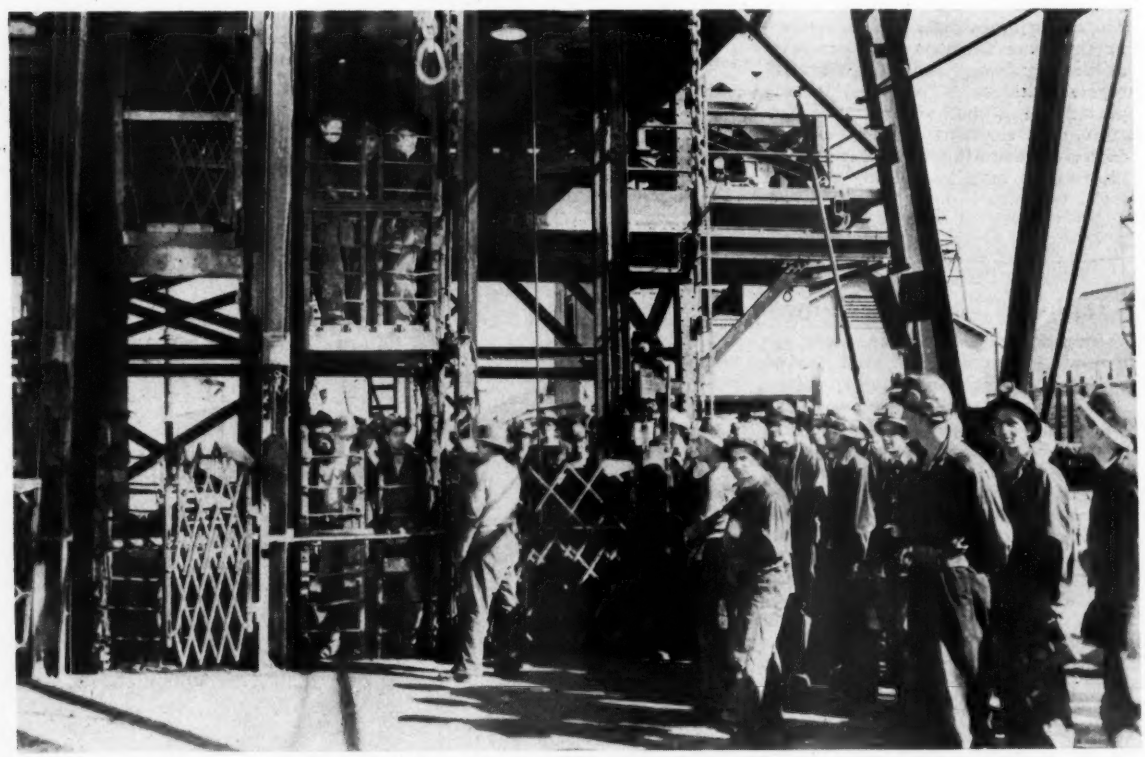
The sixth problem is encroachment of unions on the employer's right to manage his own business. Successful mining enterprise is inherently a continuous technological development, and such problems as low grade ore bodies and competing metals are a challenge requiring continuous technological improvement in processes and equipment. Management in the mining industry must be free to continue to introduce technological improvements without negotiating with the union. England for 40 years permitted trade unions to decide what technological improvements could be introduced, and any permitted introduction had to be accompanied by negotiations on wages and hours so that no saving would result to the public. The labor unions thus pressed upon a nation the misguided policy of preventing displacement of workers by machinery and at the expense of the British public, British industry and British workers, who now suffer from the low productivity resulting from obsolete and archaic methods and equipment.

Any restriction on management functions, including featherbedding, should be prohibited. We are all familiar with the featherbedding practices of the broadcasting industry and of the Lea Bill which makes it illegal for a musicians' union to require payment of wages to employes who do not work or to force an employer to hire more men than he reasonably needs. We think the Taft-Hartley Act should be amended so that the coverage against featherbedding will be as broad as it is in the Lea Bill.

The Purging of Communist Elements

The seventh major problem mentioned is that of Communism. Above all, we urge Congress to immediately complete its program of purging the Communists from those labor unions which they control or influence.

The rank and file in our mines, mills and smelters are good, loyal American



Miners' time is figured "collar-to-collar"—loading man cages at the Copper Queen Mine

citizens and are not Communists. However, the industry has reason to be concerned because of the findings of a top committee of the CIO executive board regarding the President of the International Union of Mine, Mill and Smelter Workers. The committee stated that it was proven beyond any doubt that Maurice Travis, the present holder of this office, has in the past been continuously dealing with representatives of the Communist Party in shaping union policy. The committee recommended that an administrator and an administrative committee be appointed by Philip Murray to take over the affairs of the union.

The CIO has been unable to correct this dangerous situation in the International Union of Mine, Mill and Smelter Workers. All of the Executive Board of the CIO except Reid Robinson voted to recommend that the CIO name an administrator to take over temporary control of the union. The "no" vote of Robinson was sufficient to veto any action on the part of the CIO. This is what the Dies Committee said of Robinson in 1944:

"The United States Civil Service Commission has defined a Communist as 'one who has followed the Communist Party line through one or more changes.' According to this definition, Reid Robinson has proven himself a Communist many times over. He has loyally followed the party line through four mutually contradictory changes."

The rank and file have been unable to correct the situation, although practically one-fourth of the dues-paying membership has withdrawn from the union.

The only body that can correct such a situation is Congress. The Taft-Hartley Act now provides that unions cannot be certified as bargaining representatives or file unfair labor practice charges unless the union officers file non-Communist affidavits. This applies only to future certifications and does not apply to existing certifications of unions.

We urge that the United States Congress promptly provide that the National Labor Relations Board shall immediately de-certify the bargaining agency of any local or international union if any officer is Communistic and that the board shall not in the future certify such union until it can prove that it has cleaned its house of such influence.

The Obstructionist Attitude of Labor Leaders

The membership of the Mine, Mill and Smelter Workers Union has received from the union leaders distorted ideas of the Taft-Hartley Act. The union's newspaper of September 8, 1947, quoted excerpts from a speech by Lee Pressman, General Counsel of the CIO, delivered at the convention of the International Union of Mine, Mill and Smelter Workers on August 27, 1947. The excerpts suggest that the union does not want the membership to know the truth about the law; and the following is an astounding example:

> "I have heard references made among our own people that the Taft-Hartley Act weakened or undermined the Wagner Act. That's a mistake. It did no such thing. What the Taft-Hartley Act did—it repealed the Wagner Act. There is no longer a Wagner Act in this country since the enactment of the Taft-Hartley Law.
>
> "But it was not until the Wagner Act became the law of the land that you got legal protection of your basic right to join a union of your own free choice. And, my friends, you have got to recognize, you have got to understand with a great deal of feeling that legal protection under the Wagner Act has now been repealed by the Taft-Hartley Law.

The excerpts also contain such inflammatory statements as:

> "It is not enough merely to know about that voting record (referrring to Congress); it was necessary to really sit there and watch those men and women in Congress, watch their hatred and their contempt for you and the common people of the country while they were defeating every single suggested progressive legislation and enacting the vicious legislation of the 80th Congress.
>
> "Only if you had seen that would you really begin to understand the kind of a struggle and fight in which you are engaged. Only then could you really understand the deviltry, the sinister character and the real design of your enemy and the enemies of our Nation."

Union leaders that are violently opposed to Communism also fight the Taft-Hartley Act. One wonders the reason for their vehement opposition. The answer is that the Act is the beginning of the end of the despotism of the labor bosses. Labor leaders have in the past prevented scrutiny or criticism of the actions of any labor leader by using the gag of "solidarity." Solidarity means that no action must be questioned, to do so might give aid or comfort to the enemy. Criticism becomes disloyalty.

The country met the situation caused by the Banker Barons 40 or 50 years ago by enacting laws to prevent monopolies. Justice Brandeis wrote a book on the money trusts and what he said of them is applicable to the Labor Barons and their "solidarity." Brandeis said:

> "The organization of the Money Trust is intensive, the combination comprehensive; but one other element was recognized as necessary to render it stable, and to make its dynamic force irresistible.
>
> "Despotism, be it financial or political, is vulnerable, unless it is believed to rest upon a moral sanction. The longing for freedom is ineradicable. It will express itself in protest against servitude and inaction, unless the striving for freedom be made to seem immoral. Long ago monarchs invented, as a preservative of absolutism, the fiction of 'the Divine right of kings.' Bankers, imitating royalty, invented recently that precious rule of so-called 'Ethics,' by which it is declared unprofessional to come to the financial relief of any corporation which is already the prey of another 'reputable' banker."

Labor Barons copied royalty and the Banker Barons and used the moral sanction or basis of "solidarity" to prevent criticism of themselves. They used it so often that they got to believing it themselves and when Congress recognized abuses by Labor Barons, some of their most powerful leaders thought that Congress had committed an immoral act.

Conclusion

We wish to reiterate the point that employers should exercise the right of free speech and inform their working force with respect to the new provisions of the law and the equitable manner in which they bear upon all parties.

The 80th Congress worked very hard and, in spite of a lack of cooperation from labor leaders, enacted in the Taft-Hartley Labor-Management Relations Act the first legislation in the field of general industry which considers the interest of all parties—the employes, employers, unions and the public. The mining industry appreciates this prompt, comprehensive action of Congress.

Please send your gift to your local chairman

Labor Relations in Coal Mining

A Discussion of the Causes of Grievances and Disputes Between Employer and Employe, Outlining an Approach to the Problem of Maintaining a Smooth Working Organization

By VAN B. STITH
General Superintendent
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A detailed treatment or a thorough discussion of this subject would be quite lengthy and the intent of this paper, therefore, will be to confine itself to one phase only of labor relations, namely, disputes arising from grievances in and about the mines—their proper handling and avoidance.

Classification of Grievances and Disputes

Disputes and grievances between operator and employe are as varied as they are numerous. This is a natural sequence, because the differences most often originate from a personal source and for this reason each employe is a carrier of a potential labor dispute. The causes for such grievances fall into three general classifications as follows:

1. Differences between an employe and his foreman.
2. Industry-wide wage adjustments and working contracts.
3. Off-the-job disputes.

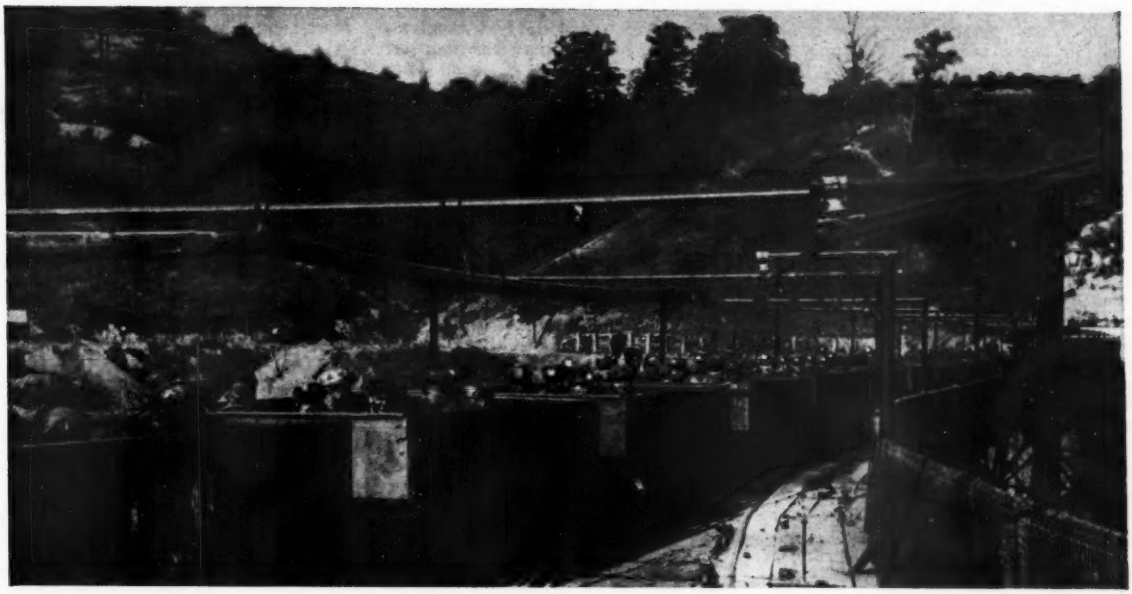
In these three general classifications are included employer discipline which oftentimes contributes to a discharge grievance. There are numerous others: racial, political, religious discriminations, complaints of defective machinery, insufficient tools, safety promotion, quality and rate of production, medical and hospital facilities, together with employment physical examinations, maintenance and sanitation of company-owned living quarters, company stores, pay shortages and pay-roll deductions, welfare work, direction of working force and in isolated communities "social activities," personal attitude and management, working conditions, the old problem of jealousy and disrespect between persons of different stages of responsibility, also jealousy between workers in "better jobs" and those of less desirable jobs.

This classification seems to cover a wide range of disputes, but in most instances the application of the term grievance or dispute is a little harsh. Most grievances grow from a very simple difference of opinion, but as far as the supervisor is concerned, no matter how significant each dispute may appear, it must be considered important and handled promptly. If not, their accumulation will shape into major issues which may affect top management. There are many instances on record where simple disputes have progressed to major issues and have eliminated the property completely. A big price to pay indeed for not heeding the small demands in the beginning.

The germ of discontent is like any other germ, it grows, reproduces and multiplies. There is no germ more adapted to rapid growth than that of a disregarded wrong, whether the wrong is real or imaginary. Indifference on the part of management toward an employe who thinks he has been done a wrong causes irritation and under long irritation men will bide their time and seek revenge at the first opportunity. I am sure that we have all known strikes where the grievance was so small that it seemed fantastic. The fact of the matter was that the strike was not caused by the last grievance; it was just the last straw. Investigation of a few of these work stoppages revealed the fact that many grievances had been shoved aside by the management. Therefore,

Talking things over while waiting for the man-trip

(Extract of a paper presented before a joint meeting of the West Virginia Coal Mining Institute and the Central Appalachian Section of A. I. M. E. at Charleston, W. Va., December 13, 1947.)



Day's work done, the man-trip brings out the crew

any intimation upon the part of an employe that he is dissatisfied with his conditions or treatment warrants investigation at once; a frequent adjustment of small things is much better than a grand adjustment of many complaints, and in addition, the grand adjustment most times comes too late.

Since the removal of the penalty clause in the contract and the adoption of the "willing and able" clause, local and prompt settlement of grievances becomes more important than ever before. The United Mine Worker officials, from the president of the District down through the field representatives, are keen-thinking men, at least they are intelligent along labor relation lines. These men know that we have a market that is demanding more coal than we can produce. They know that we have commitments with old line customers which we are most desirous of filling; therefore, if a grievance at the mine gets out of hand to the extent of having a work stoppage, you will find the grievance machinery of the union is very slow to function, especially if the employes are wrong. They just stand by, knowing that in most cases the operator will very soon give up in order to get his property producing coal again. Disputes of this nature should be avoided and most of them are avoidable.

However, once the property is idle because of an illegal strike, there should be no giving in on the part of the operator. The appeasement method of effecting a return to production is caused most times by the top management being sales minded. This type of management can see but one item; that the property is being idle while his best customers are suffering for coal. I appreciate this side of the picture, but getting a property back into production under this method is only a temporary relief and will cause more strikes and more nonproducing periods. Once forced into an issue of this nature, the operator should stand firm for that which is right.

The coal operator is in business to make money. In order to make money he must produce coal—not labor disputes. Each labor dispute curtails production, and the degree of curtailment is in direct ratio to the seriousness of the dispute. Therefore, it behooves management to handle labor differences and disputes promptly and properly as and when they arise. A management employing such a program, and thoroughly schooled in the practice of avoiding unnecessary differences and stopping grievances at the source, will have smooth sailing.

Hiring New Employes

I emphasize and recommend a rigid pre-employment program. The day is gone when the applicant asks the foreman for a job and is told "full-up," or "report for work tomorrow." Or at least it should be. I realize that some of us modified our employment standards during the recent war; we needed men and employed most anyone seeking work. Consequently we had many unnecessary headaches.

An applicant for employment should answer a series of questions designed for the information required, and his answers should be recorded by the interviewer and filed. The form may vary depending on what information is desired; previous employment is important, also his family background, information about his dependents, health of family, reasons he has applied to you for work as well as the reason he left his former employer, type of work best suited for, education, and a record of his behavior and ability while in your employment. If an applicant has a friend in your employ, try and obtain a recommendation from this friend, then if he gives you trouble you can call to account the friend that recommended him. Give the applicant a physical examination as an unhealthy person often is a very contrary person. Give him a copy of your safety rules along with the state law.

This employment procedure may seem rigid, but experience has shown that desirable applicants readily submit to the requirements. Even with an employment procedure of this nature you will get a few bad ones, but you will find that your percentage will be much above the average. I recommend that one person be responsible for pre-employment procedure. If the superintendent or foreman knows a good man and really wants to employ him, use a small recommendation form; the applicant can, of course, be rejected without embarrassment to the recommender despite the form.

Handling Disputes

Give all differences and disputes your prompt and undivided attention. Do not be impulsive in your decisions. Snap judgment of an executive handling labor disputes has too often caused unending trouble and loss to the operator. Lend importance to the

complaint by asking for time for its study. Your association secretary is just as near as your telephone, so seek his advice before making a final decision. If you cannot settle the issue locally, he will represent you later, so why not get his advice in the first place? I know through my experience of representing the operators of Kanawha District on the Labor Board, that cases handled properly at the mine reach a conclusion smoothly. On the other hand we have too many cases, I am sorry to report, where improper handling at the mines make our task nearly impossible. If by chance your company is not a member of an operators' association, then seek advice from some person in whom you have the utmost confidence. Two heads are better than one.

Time is of the essence in the settlement of all disputes, and I wish to point out to you again that although haste in judgment is undesirable, speed in the discussion of a complaint is most desirable. You may have many items of importance on your desk pertaining to the operation of your mine at the time the local committee asks for an appointment. Take my advice and set other business aside and give the committee a big ear. When the grievance is explained it may seem small and insignificant, and most of the time it really is, but treat it as important.

If you cannot settle a case, take it under advisement. Consult your association secretary, then if you continue to disagree, call all parties in and inform them of the situation. When you inform them that you cannot agree and the case must go through proper channels, be sure you convince them that the disagreement does not carry anything personal, and there is no reason for ill feelings on the part of any person or persons involved. Further, let them know that the case will be decided and that you will gladly abide by the final decision.

Discharge Cases

I wish to stress the point that one person should have the final word as to whether an employe should be discharged. As in pre-employment procedure, there should be a uniform system of discharging and I can relate many disputes that have been bungled at the mines through lack of such a system. When a discharge is merited, I would suggest that the supervisor at the mine refrain from entering into a lengthy discussion with the employe as to the reasons why he is being let go, and also recommend that such reasons should not be put in writing by the supervisor. A simple form of discharge slip is best, in my experience. If the employe brings his case before the board, then is the time to bring out the reasons.

Have a system in use whereby the person responsible for handling disputes knows at once when an employe is discharged and if the man takes his case to the mine committee, then you should immediately get in touch with your association secretary and build up your side. When a discharge slip is surrendered to the payroll office, pay the man at once without delay; if he is a good man and has been unjustly treated, he can always be rehired. A review of circumstances will determine final disposition.

Wage Rates and Time Keeping

Wage rates should never be tampered with at the mine. Classification of work should be clearly stated on the time slip, then the contract rate applied according to classification in the office where the payroll is maintained and computed. This procedure will eliminate mistakes in the interpretation of contract rates. The person designated to apply the rates must know the wage schedule and the proper method of presenting them to the employe through the pay period statement. After all, the supervisor on the job should be well occupied with production problems, so why clutter up his mind with unnecessary details of contract items?

Many methods are employed in keeping the time of labor. This item has increased in our business during the past few years since the trend is away from piece work and toward hourly rates. Omitted time has caused a great deal of unnecessary confusion. If a man works eight hours and a few hours overtime, he should receive credit for that time on the day he performs the work. It is very embarrassing for a worker to calculate that he will receive a certain amount of money in his pay envelope, then discover that he has been shorted some time.

A system should be used that will enable the workman to know each day that he has received full credit for his work for that day and such a system should eliminate any doubt as to the honesty of the employes' claim for short time. This can be accomplished by several methods, such as time

ANCHOR COAL COMPANY
POWELLTON MINE WHITESVILLE, W. VA.

NAME _____

DATE _____ CHECK No. _____

Occupation		Hrs.	Rate
Conveyor	A		
Machine Runner	B		
Loading Head Operator	C		
Tracklayer	D		
Track Helper	E		
Ventilation	F		
Lifting Bottom	G		
Moving	H		
Motorman	I		
Brakeman	J		
Hanging Wire	K		
Bonding	L		
Hoistman	M		
Electrician	N		
Lamp Man	O		
Falls	P		
Blacksmith	R		
Foreman	S		
Fire Boss	T		
Coal Inspector	U		
Supplies	W		
Greaser	X		
3563- 1			

FOREMAN _____

The employe gets a copy of this daily Time Sheet

At the company store on pay-day

clocks, duplicate work slips or posting time daily on the bulletin board. I use the duplicate time slip, one copy each day to the workman and one to the office. (See Fig. 1.) If an error is made, the workman can detect it at once and will have no trouble getting it corrected. When he receives his semi-monthly statement, if he is short, he can present his time slip copies in support of his claim. This eliminates the old argument between boss and employe as to whether the man did or did not work on some particular shift and leaves no room for doubt.

Local Agreements

This item has caused no end of headaches for those responsible for settling disputes that pass on to the board. Some management executives are pretty good salesmen and can persuade the president of the local union and the mine committee, and even a large segment of the employes, to agree on some condition or idea not covered by the contract. This is all very well, but just what do you have then? The value to be derived from these individual agreements is very questionable inasmuch as they may operate very smoothly over a period of time, then suddenly some employe finds fault, takes up his case and the operator is faced with a multitude of back pay claims. The United Mine Workers' District representatives will not support private agreements. In case a private agreement, not covered by contract is made, my advice is that the management get the approval of his Operators' Association and the United Mine Workers District officials before putting the agreement in force. If this approval is not forthcoming, then forget the whole thing. No person or group of persons have the authority to enter into any agreement which is not covered by contract.

Dealing With Labor

In dealing with labor, first convince yourselves that your employes are human—just the same as you are, and with much the same tastes, aspirations and aims. Most of the men will go along just about as you would have them go, if the course is pointed out to them in a fair and square manner. Where management fails to take labor into its confidence and does not explain its objectives and its problems, it cannot expect the employes to appreciate the company's side of the picture.

The average mine employe of today has better than a common school education. More than you would think, have high school education and even college graduates can be found laboring in the mines. The average coal miner of today owns an automobile, has a good radio, goes to the movies and lives on a much higher scale than those of years gone by. He reads the same newspapers, the same magazines and the same books as his boss. He forms opinions, expresses them, and is influenced by or influences those around him.

It is evident that some of us in the coal business are better able to handle labor disputes than others; however, all of us can do a fair job by just a little forethought and practice. Give the complaints and grievances as much thought as you do your preparation, mechanical loading, haulage, ventilation, safety, etc., and you will find yourself making progress. There are several ways to maintain cooperation, but I especially warn you against giving labor everything they ask for. The men will not respect a management who travels a one-way street.

Many production officials think it is most desirable to be hailed by the workman as a good fellow, and think they must give their men everything asked for. However, there is a better way to be popular than by giving into everything, and I most certainly believe that the term "good fellow," if it is to be correctly applied to a mine official, can be obtained by a reputation for truthfulness, fairness, ability and energy. This attitude will protect the workman as well as the operator and will continue to maintain good relations over a period of years. The operator who elects to give his men everything they ask for will soon have a spoiled child on his hands and the child is not at fault.

Basic Suggestions

Stay to the contract whether it benefits you or not. Make no person a promise of any nature. If you are wrong be prompt to say so. When you know you are right in making a decision, stick to it. Know your working contract. Work very close with your Association, as it has on file, records of decisions which you may not have heard. Deal with local disputes promptly. However, do not be impulsive in your decisions. If a labor dispute leaves the mines for adjustment you have two strikes on you to start with. Although conditions between mines are different and many disputes arise out of local conditions, some general rules can be employed as a guide, and I will conclude with just a few basic suggestions:

1. Obtain a thorough knowledge of your working contract, then adhere to it.

2. Work very closely with your operators' association.

3. In dealing with labor be fair, truthful, honest and firm in your decisions.

4. Do not make promises. If you have something to pass out to an employe, wait until you are ready and then give it to him.

5. Handle disputes promptly.

6. Do not be impulsive in your decisions.

7. Devote much time to your employment and discharge systems.

8. Make every effort to settle all disputes at the mines and with the miners.

These basic suggestions will speed up the handling of disputes for both parties, operator and worker. Procedures of this nature must have a mutual benefit and protection if they are to receive wholehearted support in their use.

A group of West Virginia coal miners

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No Scoring!

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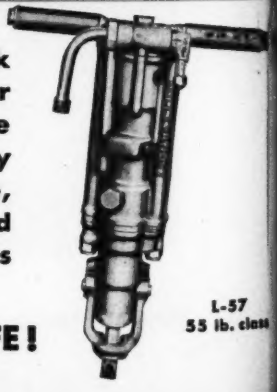

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will lower your drilling costs

Check these advantages which mean more efficient drilling. Longer drill feeds in hard rock . . . increased drilling speed . . . fewer bit changes, less time lost . . . no hole taper; increased blasting efficiency.

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GENERAL OFFICES: HENRY W. OLIVER BLDG., PITTSBURGH, PA.

The Work of the American Mining Congress in '47

Report of Julian D. Conover, Secretary, to the Annual Meeting of Members December 3, 1947

THIS meeting marks the beginning of the 50th year of service on the part of your organization to the American mining industry. Starting a half century ago as a small organization of gold mining men in Denver, the Congress has grown steadily, and today, through its widespread membership in all branches of the industry, including equipment manufacturers, and through the cooperation of the various state and district mining associations with their thousands of members, it has become an effective force in national policies which have to do with mining and its future. It fosters cooperation between the various elements in the industry, and joint action on problems of common interest. It serves as a liaison between the industry and the legislative and administrative agencies of our Federal Government. It brings together mine operators and forward-looking manufacturers of mining machinery in a combined effort to improve operating practices—to apply modern equipment to coal and mineral extraction and treatment—and to develop greater efficiency and productivity, increased safety and lower costs.

The Mining Congress serves as a focal point in the efforts so urgently needed today to maintain a sound and vigorous mining industry, capable of supplying peacetime needs and prepared to do its part in another emergency. It joins with others in the overall effort to preserve our American system of competitive and cooperative capitalism and individual liberty.

Since we met here a year ago many pressing matters have called for the industry's attention. These have been reported to you in our bulletins, our JOURNAL and in special communications. The volume of material sent out from our Washington headquarters—by mail, air mail, telegraph and telephone—has been steadily growing. We have tried to keep our members posted and to let them know when action is needed—and the response from mining men throughout the country has been gratifying. We appreciate tremendously your support, as well as the leadership of your President, Howard Young; your Board of Directors, and the chairmen of the various divisions—Harry Moses, Harry Lavender and Thomas McNally.

* * *

Two major conventions were held during the year—a Coal Convention and Exposition in Cleveland last May, and a Western Metal Mining Convention, without exhibits, in El Paso in October.

The Coal Show was the first of its kind since 1941. Registration, size and variety of exhibits and interest were nearly double pre-war. The attendance of over 9,000 and the close attention to the exhibits and the fine program arranged under the direction of George Love, proved the determination of coal producers to further modernize their operations to meet the demands of the times. Among those who attended were members of the House Labor Committee studying coal mine safety, who were deeply impressed by this tangible evidence of the industry's progress. The meeting was, in fact, a revelation to them—a demonstration that coal mining is *not* a backward, back-breaking occupation, but a modern, mechanized industry, on its toes to do a still better job. The drive for increased productivity evidenced throughout the meeting was a convincing answer to arguments of Henry Wallace and others who would

Annual dinner and business meeting was well attended

substitute nationalization for our system of free enterprise and initiative.

Studies by our Coal Division committees on operating problems and mechanization have continued, with nearly 200 operating men and manufacturers taking part; and a summary of this work, by Glenn Southward of our staff, will be appended to this report.

The El Paso Convention was attended by some 1,500 metal and nonmetallic mineral producers. Matters bearing on national mineral policies were considered, and a strong policy declaration was adopted which will be submitted to the Board of Directors tonight. Speakers included Rep. Fred Hartley, Interior Secretary Krug, Bureau of Mines Director James Boyd, and high ranking officials from Mexico. Special credit is due to Donald McLaughlin and his Program Committee, and to Ed Tittman and the International Mining Days committees, who were hosts to the meeting.

Next spring a three-day coal meeting will be held in Cincinnati, and a committee under T. G. Gerow has the program already pretty well mapped out. The Metal Mining Convention, with a large machinery exposition, will be held in the San Francisco Civic Auditorium in September with Worthen Bradley as Chairman of the Western Division and E. S. McGlone as Program Committee Chairman. Our Golden Anniversary meeting will thus coincide with the 100th anniversary of the discovery of gold in California.

* * *

We have here tonight the page proofs of Paul Tyler's book "From the Ground Up," which we mentioned last year. This has been held up by delays at the printers, but it will be off the press next month. Its basic facts on our mineral industries and its analysis of the "have-not" controversy will be of real value to members of Congress, other Government officials, and to the general public in considering mineral policies.

* * *

Taking up our legislative work, you may recall our speaking last year of the "Regulation of Lobbying Act" which had just gone into effect. This Act has in no way affected the work of the American Mining Congress. It was not necessary for us to register as an organization, but those members of our staff who engage in direct legislative work have registered, and have continued to discuss pending matters with members of the House and Senate interested in having the viewpoint of the mining industry. The Act itself recognizes the value of such a service to the members of Congress.

* * *

In the 80th Congress there were three major problems in which the mining industry, together with industry as a whole, was deeply interested.

Portal-to-Portal

First of these was the portal-to-portal legislation. We appeared before both Senate and House Committees, urging prompt action to protect employers against the wave of ruinous claims for "walking time" and other activities which had never been considered as part of the work-day. We also urged a shorter statute of limitations, a definition of work time in terms of established customs and agreements with employes, and the removal of "hidden liabilities" under the Wage-Hour statutes by enabling an employer to rely in good faith on administrative rulings. The Congress passed and the President "reluctantly" signed a measure which carries out these principles. Apparently the Wage-Hour Administrator is trying to place limitations on its application, but the final decisions will be made by the courts.

Labor Legislation

The second major problem was a rewriting of the Wagner Act, to curb abuses of labor leadership, equalize the responsibilities of unions and employers, and restore true collective bargaining. The labor committees in both Houses held lengthy hearings, at which the views of the mining industry and its experience under existing one-sided legislation were ably presented—in the Senate by Charles Kuzell and Frank Ryley of Arizona, and in the House by your President, Mr. Young. Numerous conferences were held between the representatives of industry in Washington; mining men were kept informed as the legislation progressed, and the industry's viewpoint on many important points was made known to leaders in both Houses. Certain important issues had to be compromised by the House and Senate conferees; but final passage, despite a presidential veto, of the Taft-Hartley Act—with all its benefits to individual workers, to responsible unions, to employers and to the public—was the most important forward step in sound labor legislation in many years. This new Act *must* be given an opportunity to work, and the terrific campaign organized by labor union heads to misrepresent it and obtain its repeal or emasculation *must not* be allowed to prevail.

Further legislation, to simplify the Wage-Hour Act and do away with artificial and oppressive requirements that have grown up under it, is a possibility for this coming year. There is growing recognition that this Act, intended to spread employment, now holds down production and adds to inflation, and is a source of needless harassment to industry. In the event the next session of Congress undertakes any amendment of the Act, in response to labor demands for upping the minimum wage or otherwise, adequate revision of the overtime provisions is of the highest importance.

Meanwhile, we have presented to the Administrator, now holding hearings on the subject, our recommendations for changes in the definitions of executive, administrative and professional employes who are exempt from the Act's requirements. We have urged adoption of the corresponding definitions in the Taft-Hartley Act, which were carefully considered by Congress; or if this is not done, that a $300 monthly salary be recognized as a further criterion for determining exemption.

Taxation

The third major issue before the Congress—tax reduction and tax revision—has not yet been satisfactorily treated. Two efforts to reduce the individual's tax load and afford incentive for investment in risk enterprises were blocked by a White House veto; and the fate of a third attempt, to be made early next year, remains in doubt.

Our Tax Committee, under Mr. Fernald's leadership, has stressed the need of tax rates and administrative provisions which will justify venture capital in assuming the hazards of mineral discovery and development, and of re-equipping and modernizing mining properties. Last July, looking toward a general revision of the revenue law, we submitted to the Ways and Means Committee a full statement of the industry's position, outlining various specific changes needed to remove inequities, correct mal-administration, and remove impediments to mining enterprise.

We supported the allowance of percentage depletion on a permanent basis to various non-metallic minerals, including fluorspar, barite, talc, vermiculite, trona and others—and this measure has now been enacted into law. We also urged repeal of the unnecessary silver transfer tax, a matter which will require further attention next year.

Mr. Fernald will report further as to the work of our Tax Committee and Mr. Huston will report for the Committee on Social Security.

* * *

Other legislation of concern to the mining industry has covered a wide front, but can only be touched on briefly at this time.

Stream Pollution

Drastic bills for Federal regulation and policing of stream pollution, which were inactive during the war, have again been considered in both Houses. The Mining Congress organized testimony on behalf of a group of affected industries. Mining's viewpoint was effectively presented by Vice President Donald A. Callahan of Idaho, Robert M. Searls of San Francisco, S. H. Williston of Oregon, Dr. Harold J. Rose of Pittsburgh and others representing bituminous coal producers, and H. H. Otto of the anthracite region. The bill as rewritten and passed by the Senate was greatly toned down, recognizing the authority of the respective state agencies and limiting the powers of the Surgeon General; but it is still open to objection as a first step toward centralized control of widely varying local problems.

Mine Inspection

Last Spring, following a disastrous coal mine explosion, proposals were actively considered by Congress under which Bureau of Mines inspectors would be given police powers, and violations of the Coal Mine Safety Code would be made criminal offenses, with heavy penalties. Vigorously opposed, these measures were cut down to a simple resolution, effective for one year, directing Federal inspectors to notify state inspection agencies of code violations, with emphasis on catastrophe hazards.

This same issue may again present a serious threat in the coming year; and it should not be overlooked that certain suggestions were made to delete the word "coal" in the proposed legislation—thus applying Federal police powers under blanket regulations to all types of mines in the country.

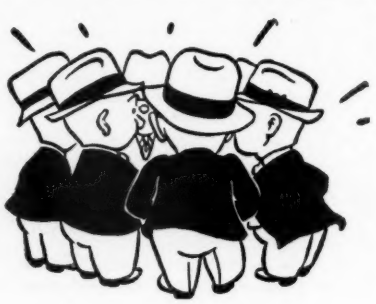
St. Lawrence Project

The St. Lawrence Project is again under consideration, with a favorable report due next month from the Senate Foreign Relations Committee. As before, opposition has been expressed on behalf of coal and iron ore producers, as well as by the railroads, shipping interests and labor organizations; but the pressure for adoption is strong and only a determined and strongly organized opposition can stop it.

Tariff

Renewal of the Foreign Trade Agreements Act in 1946 enabled the State Department to negotiate the recent Geneva agreements, under which tariff rates as a whole have been reduced to approximately the levels of the Underwood Act of 1913. Representations to the Committee for Reciprocity Information warded off threatened cuts in various mineral tariffs, but the reductions which were made are of serious import to mining.

Whatever contributions these agreements may make to the increasing of international trade, so far as mining is concerned, it is apparent that they fail to carry out a White House pledge not to "trade out" segments of American industry or labor. The escape clauses give no more promise of relief than was obtainable under earlier trade agreements. The Act will again be up for renewal next year, and another battle is in prospect, not only over amendments to safeguard domestic producers, but over the whole question of executive authority over tariff rates.



Stockpiling

The stockpiling program has been proceeding slowly, and certain of the procurement policies have been unrealistic and subject to criticism. Recent suggestions by the Herter Committee on Foreign Aid, that repayment for such aid be made in strategic materials for stockpiling, again stress the point, upon which we have insisted, that such accumulations be sterilized and held off the market, with careful protection against release from stockpile except in a national emergency declared by Congress; the committee further emphasizes the need of adequate development of our own mineral resources for national defense.

Certain amendments to the present Stockpiling Act have been proposed, notably in the Ploeser bill under which purchases could be made from marginal mines under contracts at higher than market prices. The President's veto of the Allen bill, which would have continued the Premium Price Plan, has left open the whole question of an incentive program to aid the marginal segment of the industry and to foster exploration for and development of reserves.

Public Lands

Government encroachment into private industry would be carried to a new high under a "national fertilizer bill" which, among other things, would nullify certain rights of potash and phosphate producers operating under Federal leases. Strong resistance to any such proposal, such as was expressed before a Senate Committee by Horace Albright, Louis Ware and others, must be continued.

The mining industry must also be on guard against any attempt to extend the Federal leasing system as a substitute for private ownership under the mining laws. The potash producers' experience under the leasing laws demonstrates all too fully the continued investigations, regulations, inspections, restrictions, prohibitions, harassments and discouragements that may be inflicted under bureaucratic control.

In connection with the older mining laws, also, continued efforts are needed to reverse administrative practices under which technical and unreasonable requirements have been imposed and the granting of patents has been unduly delayed, with resulting discouragement to mining development.

At the industry's suggestion, Congress has refrained from acting upon certain proposed changes in the mining location laws to establish so-called "geophysical" mining claims. The question of affording protection to those who spend large sums in searching for "blind" ore bodies received close attention at our recent Western meeting, but a satisfactory answer has not yet been evolved.

Advisory Committee

A year ago, at Secretary Krug's request, your Board of Directors appointed a small committee, headed by Howard Young, to advise the Interior Department on mining matters. When this committee met with Mr. Krug, they were asked to consider the formation of one or more larger advisory groups, to be appointed by the Department. Concrete suggestions were submitted, and the personnel of a 31-man "National Minerals Advisory Council" has now been selected by Secretary Krug and asked to meet with him on December 12 to consider national mineral policies. The question has also been considered as to whether a Coal Industry Advisory Council should be formed along similar lines.

Under Dr. James Boyd and Dr. William E. Wrather, the Bureau of Mines and the Geological Survey are now headed by men of proved ability who have a sympathetic understanding of mining and its problems. Last summer, Dr. Boyd's appointment was held up in the Senate, following vociferous objections by John L. Lewis, and the nomination has just been resubmitted. At our El Paso meeting, Dr. Boyd was heartily endorsed by the assembled mining men; and last week, as his nomination was on the way to the Senate, we wired to key mining men throughout the country, suggesting that their views be communicated promptly to their Senators. The response was immediate, and Dr. Boyd is being supported not only by coal, metal and non-metallic mining men, but also by the oil and gas, crushed stone, and sand and gravel industries.

Freight Rates

The railroad's current request for another general increase in freight rates has again been resisted by the industry, as unduly burdensome and tending to reduce production. Where rates are based on the value of ores handled, revenues to the carriers have already increased substantially as a result of higher metal prices. Current reports indicate that a still further hike in rates of 3 per cent will be asked, on top of the 27 per cent already under consideration.

Government Controls

Since our meeting a year ago, arbitrary controls on the coal and metal price structure have been lifted, and many of the wartime limitations on doing business have been removed. Now, however, in connection with the foreign aid program, advocates of a planned economy seek the extension and strengthening of emergency powers due to expire shortly, and the reimposition of many wartime controls. The President's demand for "selective" allocation, rationing, price and wage controls has been followed by a parade of high officials before House and Senate Committees, seeking: allocation and price controls over coal and oil; allocation and priority powers over steel and non-ferrous metals; inventory controls over scarce commodities; strengthening of export controls; and controls over transportation facilities, rents, commodity speculation, and credit facilities.

Whatever the temporary justification for certain of these measures may be, it is clear that the reimposition of the whole range of wartime powers to control our economy would serve to stifle incentive and hamper the free production and distribution of materials which is the real answer to domestic and world needs.

A detailed report of all the activities of the Mining Congress would take far more time than we have available. Other matters that have called, or will call, for attention include:

Current interpretation and administration of numerous laws affecting mining—Wage-Hour and other labor legislation, revenue laws, social security, premium prices, export restrictions, etc.

Publication of a statistical handbook, giving labor and employment data for the various branches of the mining industry;

Mine financing—lifting of unnecessary restrictions on the sale of primary mining securities; RFC development loans;

Problems of the gold mining industry;

Monetary legislation;

Special problems of the "strategic" minerals;

"Fissionable" materials; atomic energy;

Natural gas pipe-lines;

Government-subsidized competition;

Mine safety;

Foremen's unions;

FEPC legislation;

Government reorganization;

Restrictions on corporate mergers;

Exploration premiums;

Topographic and geologic mapping;

Problems of the small mine operators;

Mining in Alaska—Wage-Hour restrictions, Indian reservations, suspension of assessment work, mining in navigable streams, etc.;

State legislation—in which we have continued our service as a clearing house for information on pending legislation, and on action taken in the various States;

Correcting of public misunderstanding of mining's needs and problems;

And in general, reporting on developments in the Nation's Capital, and responding to the many requests for specific information on the mining industry from members of Congress, Government agencies and the press, and on Governmental matters from members of the industry.

* * *

Finally, Mr. President, we wish to express once more our very sincere appreciation to all of you who have participated in the work of the American Mining Congress. We hope you will continue to express your views to your representatives in the House and Senate, as forcibly as possible, as new issues arise. There will be plenty of these, and your cooperation will be urgently needed. It is only through team work that the mining industry can continue to advance and secure proper recognition of its needs.

Work of the Coal Division Committees During 1947

By GLENN B. SOUTHWARD

Mechanization Engineer

UNDER the stimulus of full-time operation of the mines, and facing the question of meeting high wages with greater tonnages from men and machines, the Coal Division Committees during the past year have been very active in their studies on postwar mine operation. The subjects selected for study deal with the mining problems which are most vital today and the committee reports are based on authentic data furnished by both operators and manufacturers. With this background of experience, presented impartially and without bias, the reports are recognized by the industry as containing data which is available from no other source. The committees definitely do not make recommendations—their object is to show the conditions where certain practices and equipment have proven advantageous, and to assist the industry in raising productive efficiency.

Each report, after preliminary preparation by a subcommittee, is reviewed by the committee as a whole and either approved or referred back for revision. When finally approved, it is published in MINING CONGRESS JOURNAL and reprints are circulated to our membership. The requests for additional reprints, and the favorable comment which the reports have received from the industry, are very gratifying to the committee members who give their time and effort to the compilation and preparation of the data.

While much of the committee work is carried on by correspondence between the members and through correlation of data by our Washington office, each committee has usually two meetings per year, one in the Spring and one in the Fall. Following this latter meeting, the Annual Conference of the Coal Division is held, at which all committees get together to present their reports and discuss them in open meeting. This serves to bring all committees into closer contact and to schedule their studies for a more complete coverage of mining problems.

During the year 1947, the following reports were completed and published in MINING CONGRESS JOURNAL:

(1) *Coal Mine Haulage Accidents*, by the Safety Committee. A study based on statistics covering the United States and also several individual states, showing the number of haulage fatalities and injuries which occurred, where they occurred, and from what causes. This report is designed to encourage a program for greater safety in coal mine haulage.

(2) *What Roof Conditions Permit Pillar Recovery*, by the Committee on Roof Action. Describes the various types of mine roof and discusses the effect which each type has on the percentage of coal that can be recovered economically.

(3) *Pillar Mining with Mechanical Loading*, by the Committee on Mechanical Loading. Describes pillar extraction under medium strong roof, showing how the application of the block system has been successful in making a high recovery.

(4) *Methods of Pillar Recovery*, by the Committee on Mechanical Loading. Showing methods of pillar mining under a very strong roof, using the conventional room and pillar system with a break line extending across three panels.

(5) *Main Line Mine Haulage with Belts*, by the Committee on Conveyor Mining. Submits detailed estimates on the cost of installing and operating main line belt conveyors, covering installations of varying lengths and different grade conditions.

(6) *Main Line Haulage with Track*, by the Committee on Haulage-roads. Gives detailed estimates on the cost of installing and operating main line transportation with mine cars and locomotives, covering various lengths and grades.

(7) *Full Seam Mining*, by the Committee on Surface Preparation. A preliminary study showing how the amount of refuse handled with selective mining is increased when operating full-seam mining with mechanical loading.

(8) *Coal Losses in Washer Rejects*, by the Surface Preparation Committee. A continuation of the study on full seam mining, calling attention, by charts and tables, to the dollar and cent values of the fuel lost in washer rejects unless efficient separation methods are used.

Committee Membership

During the past year, there has been an increase in the committee membership and further additions, as interest in the work grows, are expected during the coming year. The following table shows a total of 180 men on the eight working committees —120 operators and 60 manufacturers; besides these, there are a number of alternates who bring the actual total to well over 200.

	Operator	Manufacturer	Total
Conveyor mining	16	6	22
Underground power	20	18	38
Haulage-roads	7	8	15
Mechanical loading	17	6	23
Roof Committee	9	1	10
Safety	27	3	30
Surface preparation	17	15	32
Ventilation	7	3	10
Total	120	60	180

Improved Mining Methods Through Production Engineering

Improvement of mining methods and increased mechanization brought about by careful analysis, experimentation, and development have been the mining industry's principal means of maintaining operations in the face of manpower shortages and increased labor and material costs. The process of method development is outlined here with the aim of aiding operators to attack their own problems.

★

By R. W. JENKINS
Special Representative
Joy Manufacturing Co.

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WITHIN the limits imposed by the physical characteristics of any ore body there is usually some choice of mining method. This choice is covered by several factors among which are ground conditions, attitude and skill of available labor, the availability and cost of operating supplies, and the possibility of applying newly developed mechanical equipment. The most efficient mining method that could be used at any time would take the fullest cognizance of these fluctuating factors. The necessity of constantly evaluating, modifying, and developing new methods has evolved a field of work called production engineering.

It is the function of production engineering to constantly analyze mining conditions, to experiment, and to develop new methods. The next step is to apply these methods by instructing supervisors and miners in their application and to control the methods by engineering and cost data.

Changing ground conditions at certain mines might make standardization of doubtful value; however, by establishing and maintaining standard cycles based on thorough study it becomes evident that the provisions made and carried out for ground support not only assist in control but actually eliminate most of the delays caused by weight and caves.

From the production engineering standpoint, mining is essentially a periodic operation. The products of excavation are available intermittently, only after a cycle of breaking, shoveling, and support operations have been performed. The control that an operator has over his costs and productivity depend, to a large degree, on the sequence and performance of these three operations.

The number of cycles necessary to remove all the ore in a block varies with the mining method used. Certain block caving or blasthole methods, where production is practically continuous after block preparation, excavate in one cycle. This varies to the hundreds of repeated cycles in the case of narrow stopes. It is obvious that the time consumed and the amount of material excavated per cycle varies inversely with the number of cycles. Improvement in productivity results from either excavating more material per cycle, completing more cycles per unit of time, or both.

Mining Method Hinges Upon Best Breaking Practice

In analyzing mining methods by separating the cycles into their essential operations, it becomes increasingly apparent that the key operation is breaking. The largest field for improvement in the cycle lies in increasing the time available for breaking, and in increasing the breaking efficiency. Working faces cannot be advanced any faster than the excavating is accomplished and the efficiency of shoveling or support is largely determined by the nature of the broken ore to be handled and the condition of the walls. Therefore the best approach to an improved mining method is to develop the most efficient breaking practice for an ore body and build the other operations around it. To approach the ideal condition breaking should be continuous. This condition is approached in block caving and blasthole methods when the shoveling and support operations are conducted concurrently with the breaking, or withheld until the block is completed. Where, due to ground conditions or narrowness and irregularities of the ore body, intermittent breaking is necessary, stopes must be arranged so that other operations are done with the least interference to breaking.

Tremendous strides have been made in the efficiency and development of new methods in breaking in all types of ore bodies. The rapid development of barodynamics has increased the range of application of block caving. More efficient undercutting and cut-off procedures have reduced the cost and time needed to prepare blocks for caving. Draw-control studies have improved the control of extraction, dilution, and fragmentation in the caving blocks. There is considerable indication that a combination of block caving and blastholing will have an increasing range of application.

"AX" Blastholes Result in Improved Fragmentation

Intensive study of drilling and blasting techniques has resulted in more tons per foot of hole drilled, more feet drilled per man shift, and decreased powder consumption. This has been true both in the fields of conventional and long-hole drilling. The improved arrangement of diamond drilling patterns in blasthole mining has been augmented by studies on hole size and firing. Certain mines have found it advantageous to drill the larger "AX" holes in place of the "EX" size. The better fragmentation resulting and decreased powder consumption has made up for the increased drilling cost. The development of new methods of firing multiple hole rounds has also been reflected in better fragmentation.

Experiments conducted with drifter-type drills, particularly in Canada, has developed the fact that 1½-in. starter bits can be used with a considerable increase in drilling speed and a decrease in power consumption. The smaller bits have also enabled the use of lighter machines and more holes per man shift can be drilled. It is desirable, when consistent with efficiency, to break the longest possible round from one setup of the drilling equipment. Notable in this respect is the development of burn and shatter cut rounds. Depth of round pulled is gradually approaching the range of 7 to 9 ft. and it is apparent that 14 to 16 ft. rounds are feasible. The development of these longer rounds has led to standard rounds adapted

to the ground and drilling equipment. Design of drift rounds, particularly adapted to the jumbo used, is necessary in order to gain the greatest amount of drilling per man-shift. Placement of holes is obviously important from an efficiency standpoint and there is a growing appreciation that it is highly important to control drilling to eliminate excessive timbering, dilution, and safety hazards.

One of the important results of improvements of small-hole bits is that they will drill two or more conventional changes in most ground. For this reason it has been desirable to extend the length of the drill feed. This gives the effect of parallel-walled holes as well as more rapid penetration due to not having to change the steel and bits. Development of long-feed machines, coupled with the design of boom-type jumbo arms for supporting them, has considerably increased the footage per man shift obtained in flat deposits and drift and tunnel headings. Track-mounted and crawler-mounted jumbos are now widely used in mines and self-propelled, pneumatic-tired carriages are available. Jumbo design to date has indicated that considerable potentialities exist in the use of remote-control, power-operated arms for moving the machines from hole to hole.

New Bits Have Definite Application

Tungsten carbide bits are proceeding rapidly through the development stage and soon will be available for general use. They are particularly adaptable to long-feed machines for drilling under ordinary ground conditions as well as the unusual ground conditions where present carbon steel bits are expensive and unsatisfactory. The Joy Manufacturing Co. has recently announced the availability of carbide bits. Although much is to be learned, work to date indicates that they are satisfactory for many applications.

Outstanding progress in the handling of broken ore and waste has been made. In this field mechanization finds its greatest application. Slushers are being increasingly used in scram drifts for block caving and blasthole mining. They contribute to lower loading cost and increased safety as well as elimination of much development work required by the conventional grizzly and ore-pass systems. The trend is now toward large units of 100 hp. Installations of shaker and belt conveyors have shown that a considerable field exists for this type of haulage.

The use of slushers in narrow veins for development, removing ore, and distributing the fill, has been well covered in technical literature. Slushing in bedded and flat dipping deposits is well developed. The use of crawler-mounted and track-mounted portable slusher ramps has received wide acceptance in this field where mobility is essential. Consideration is being given to the use of slushers in conjunction with shuttle cars to combine the advantages of slushing with trackless mining. Trackless mining has considerable possibilities in application to bedded and flat deposits of all kinds. Several large installations of trackless mining are now under way. These will be used in conjunction with mobile drill jumbos and crawler-mounted, continuous, high-production loaders.

Mine-car loaders are being widely applied in development and sill work. There is considerable interest in using this type of loader at loading points in place of chutes. This is particularly applicable in ore deposits where

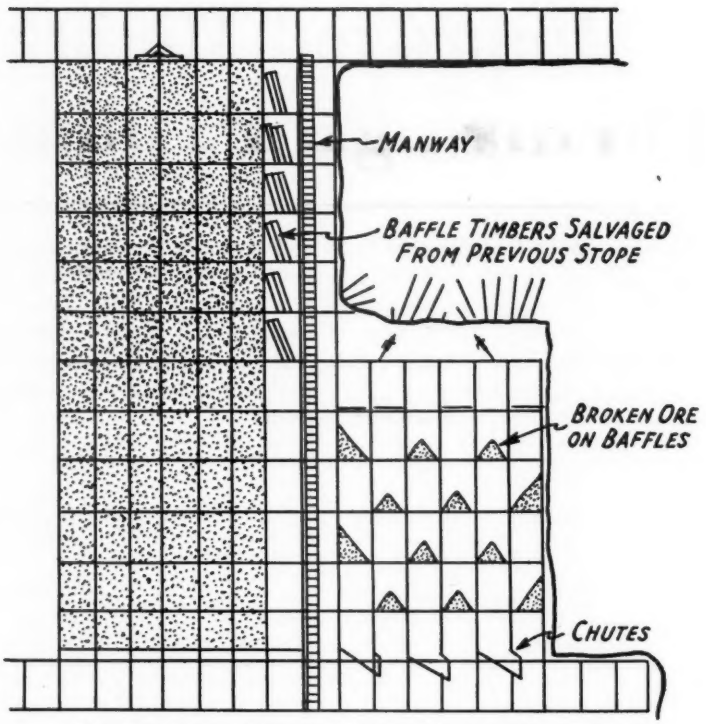

MANWAY
BAFFLE TIMBERS SALVAGED FROM PREVIOUS STOPE
BROKEN ORE ON BAFFLES
CHUTES
SECTION ALONG NARROW VEIN IN VERTICAL SLICE STOPE

Fig. 1.—Efficient method planning permits two drills to operate conveniently and eliminate mucking

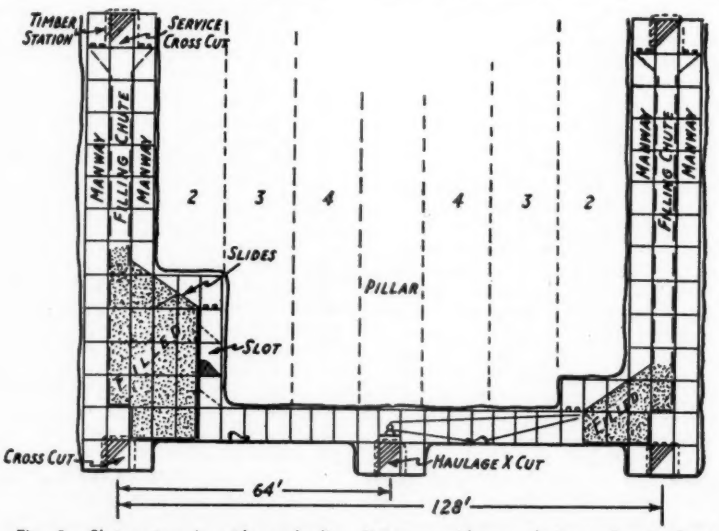


Fig. 2.—Slot system in wide orebodies dispenses with ore chutes and cuts down mucking

it is difficult to control fragmentation and large rock must be handled. An extension of this application is expected which, with a development of high-production mobile loaders, can be applied in conjunction with trackless mining.

Fill Supply Should Be Keyed to Demand

Where filling is necessary, it is important to have an adequate supply on hand at all times to avoid having places shut down while waiting for fill. Meeting this demand has required the development of efficient waste-pass systems and improvements in level haulage. More mines are augmenting their development waste supply by obtaining surface sand or underground waste by block caving.

In addition to the periodic cycle of the mining method, considerable fluctuation in the rate of production occurs during the life of the stope. This varies as a stope is being prepared or silled off, as it is going through the middle of the block, and as it approaches the sill above. This fluctuation in the daily as well as in the over-all production of the stope is reflected in the peak-service demand for pulling ore and supplying fill and timber. Since efficient utilization of service facilities requires a constant demand, this fluctuation must be leveled off. It is necessary to integrate the production of several stopes to maintain a smooth flow of ore to the surface and to avoid service delays. To accomplish this, it is desirable to distribute the production from an ore body over several stopes which are easier to maintain and coordinate, particularly where geological conditions vary. It is also desirable to concentrate the stoping activity for conservation of service facilities, particularly supervision, haulage, and ventilation.

Planning to Coordinate Operations Pays Off

Planned production can only be maintained by planned service. With the standardization of mining methods, it becomes possible to anticipate the service requirements. Provision must be made before operations start to have the proper amount of car service for handling ore. Fill supply, if necessary, should be predetermined and arrangements made for its availability on schedule. Timber and tool service depots should be established near the center of the mining operations and provision made for keeping these items on hand in the required quantities. A definite system of ordering supplies and moving them underground should be established. This is so important that many of the larger mining companies have men detailed to follow up service in order to see that the flow is maintained and that any unusual demands are anticipated.

Excellent examples of the application of these principles of production engineering to specific ore bodies have been covered in the paper "Vertical Slice and Slot Mining in Butte," by L. F. Bishop. In a narrow vertical-slice stope, note that in drilling from below enough face is exposed for two men to drill a full shift without interference (see Fig. 1). The setting-up and tear-down time is distributed over the maximum number of holes. The stope is arranged so that the blasted muck falls on grizzlies with most of it going through to the breakers. Except for the small amount of rock hanging on the grizzlies and timber, the mucking has been largely eliminated from the cycle.

The timbering is simplified by using gob lagging and breakers in place of chutes. This eliminates chute raising and maintenance. The additional storage room is important, particularly when the stope is just starting. The essence of this method is speed. The length of stope is determined by what two men, each with a drill, can drill out and blast in one shift. By advancing rapidly, it is possible that the stope can be completed before filling is necessary, thereby eliminating this operation from the cycle.

Application of the slot system to wider ore bodies eliminates chute lining and mucking is simplified by the use of slides (see Fig. 2). The filling is done without interfering with the mining operation. Breaking depends upon the condition of the ground but, normally it is possible to blast a complete row. Again, speed is the essence of this stope. The use of a short block allows advance from sill to sill under rather poor ground conditions with a minimum of timber replacement and repair. As illustrated, the block is mined from two sides.

A panel system of vertical slice stopes for narrow veins enables development and servicing of a maximum amount of ground with a minimum amount of haulage and raise footage (see Fig. 3). The production and service requirements can be closely coordinated.

The time spent in analyzing and studying mining methods pays handsome dividends in increased productivity and lowered costs. Important as this is, most operators agree that their studies to date have but opened the door to future potentialities, particularly in further mechanization. With the current man-power situation an accelerated program of mechanization combining the efforts of manufacturers and mine operators may be anticipated. Every repetitive act performed is potentially mechanical. The problems of applying and integrating mechanical equipment will provide an even greater field for the application of production engineering to the improvement of the mining methods of the future.

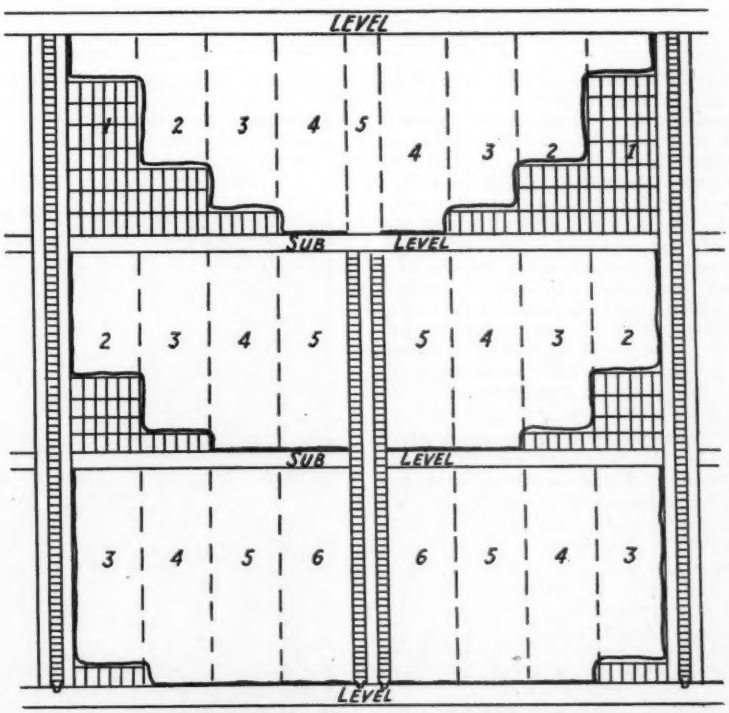
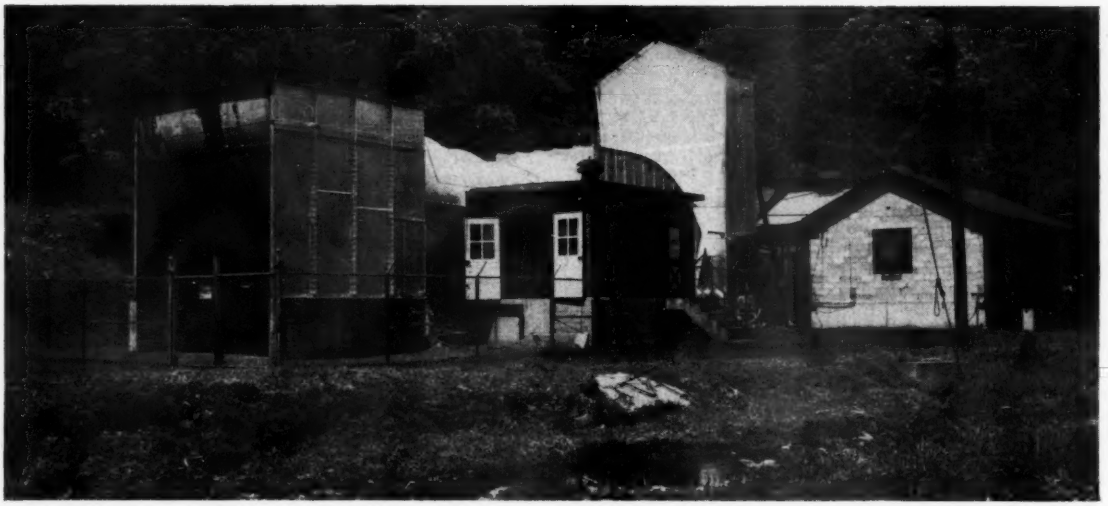


Fig. 3.—Panel development of a block enables coordination of operations for maximum production with a minimum of raise footage



Minister Run Shaft Head

An Elevator For Man-Trips

An Auxiliary Shaft of a West Virginia Coal Mine Installed an Elevator With Automatic Control for Men and Small Supplies

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By C. L. BROWN

Mining Electrical Engineer,
Coal Mine Inspection Division, Bureau of Mines,
Pittsburgh, Pa.

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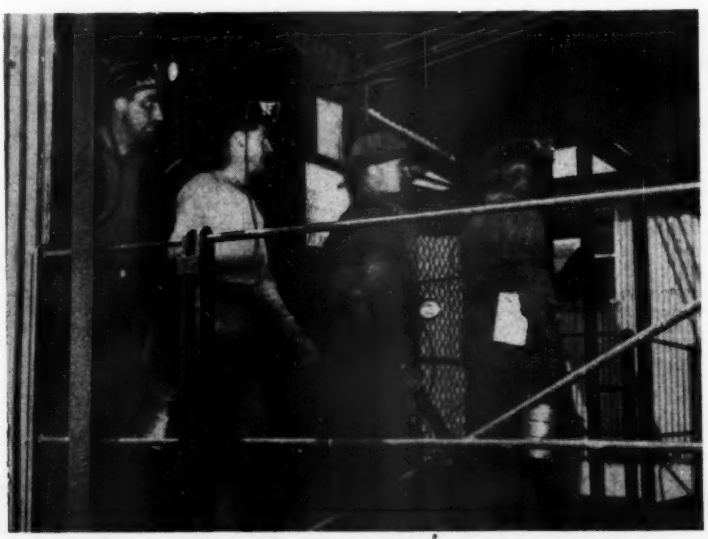
THE Consolidation Coal Company has installed unusual hoisting equipment to raise and lower men in the Minister Run shaft of No. 93 mine, Marion County, W. Va. This shaft is approximately 3½ miles from the main portal and serves as an airway and emergency escapeway, as well as for the regular ingress and egress for an average of 112 men who use the shaft twice a day during three shifts. The shaft is 252 ft. deep, and the overall cross-sectional dimensions are 32 ft. by 13 ft., with semicircular ends. It is lined with brick on concrete and two double brick partitions form a 13-by-6-ft. compartment in the center.

An elevator for raising and lowering men in the shaft was placed in service on August 6, 1944. Twenty men as a maximum are loaded on the elevator car; foremen supervise the loading on two shifts.

The total weight of the car is 4,186 lb. and the load capacity 4,000 lb. The contract hoisting speed is 350 ft. a minute; dangerous overspeed is prevented by a governor set to function at a speed of 490 ft. a minute. The elevator car is equipped with push-button controls but is stopped automatically at the landings. An emergency stop button is provided to stop the car at any point between landings; after a definite time interval following an emergency stop, the movement of the car can be resumed in either direction. The time delay feature is incorporated in the controls to



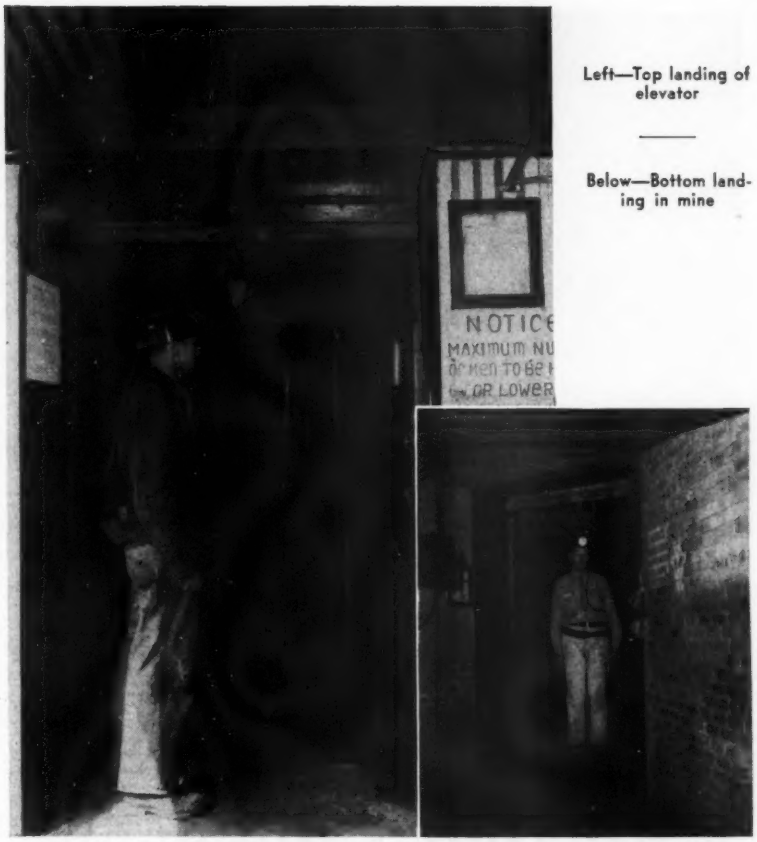
Mine workers leaving elevator at top

(Published by permission of the Director, Bureau of Mines, U. S. Department of the Interior.)

prevent sudden reversal of the movement of the car. The Gail 542 control system is used; it consists of a contactor panel equipped with contactors for starting, running in either direction and stopping. Auxiliary devices are connected to the panel through control circuits.

Safety features incorporated in the controls include slow-down stop and final limit switches that govern the maximum travel of the car, and an electrical interlock prevents the car from being moved while either the car door or shaft door is open. A bell on the car is connected to the top and bottom landing switches and rings if an attempt is made to move the car from the opposite landing when the elevator or shaft door is open. A solenoid brake, which is energized by 110 volts direct current, is installed to hold the car at any position when the motor is de-energized; the direct current is obtained through rectifiers from a 220-volt alternating current circuit.

Mechanical braking equipment on the car is designed to prevent a free fall because of failure of equipment. Deceleration of the car during normal operation is accomplished by reducing the speed of the motor to one-half speed a few feet before the car reaches a landing.



Left—Top landing of elevator

Below—Bottom landing in mine

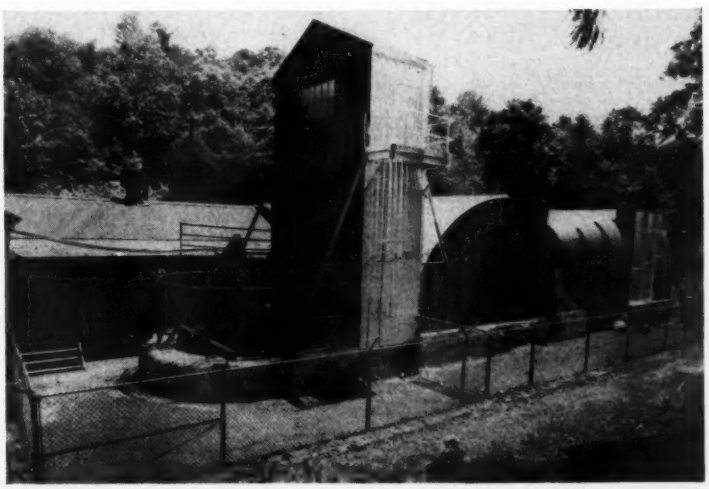
Installation Features

The elevator car is supported by means of six ¾-in. traction steel ropes of Seale construction, 8 by 19 stranding, and designed for a breaking strength of 24,000 lb. each. The ropes are attached to the elevator car and extend over the sheaves with the opposite ends attached to the counterweight. The ropes are counterbalanced by means of two chains that together have approximately the same weight as the six ropes; the chains are connected to the bottom of the elevator car and to the bottom of the counterweight. The governor rope is ½in. cast steel, 6 by 37 stranding, and designed for a breaking strength of 12,000 lb. Both ends of the rope are attached to the safety device mounted under the platform of the car. The governor rope travels through the governor when the car is in motion in such a manner that the power circuit is de-energized and the safety dogs applied in case of overspeeding. Oil buffers are provided under the car and counterweight for the purpose of cushioning.

The elevator is driven by means of a traction sheave over which the ropes pass. Mechanical power is applied to the sheaves from a 50-horsepower, 220-volt, three-phase, 60-cycle, 170-ampere motor, which has a speed of 450/900 revolutions per minute.

Signal lights are provided at each landing to indicate whether the car is moving or available for use. A signal is also provided to warn against leaving either door open when the car is unattended, a condition which would prevent movement of the car from the other landing.

The coal company inspects this equipment daily; the total time required for maintenance and inspection is reported to average two man-hours per working day. An insurance company inspects the equipment semi-annually and the West Virginia Department of Mines four times each year.



Rear view of man elevator headframe

Gathering Haulage With Belt Conveyors

A Committee Report Covering Estimates for Installing and Operating Gathering Haulage With Belt Conveyors

By A. E. LONG
C. W. THOMPSON
ROBERT FLETCHER

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The Conveyor Committee wishes to call special attention to the fact that these estimates should not be considered as applying directly to any actual operation. The purpose of the report is to indicate a method of estimating the cost for installing and operating coal mine haulage with belt conveyors and the figures given here must be adjusted to suit whatever individual mining conditions may be under consideration.

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A CONTINUATION of the study of coal mine transportation with track and belts being made jointly by the Conveyor and Haulageroads Committees is presented here. The first portion of the study, covering Main Line Haulage with both types of equipment, as approved by both committees, was published in the August, 1947, MINING CONGRESS JOURNAL, but to make the study complete, both committees are now preparing estimates on gathering haulage. This is taken to be that portion of the transportation system which extends from the end of the main line back into the working panel. Both committees further consider that the gathering haulage will extend along the panel entry but will start at the room necks of the working places and will not cover the method of bringing the coal away from the faces. There are a number of ways and methods used for what is termed "service haulage"—mine cars, shuttles, chain and shaker conveyors —and for this reason, both committees assume that the gathering haulage begins where the coal starts on its trip to the outside.

The report submitted here covers the use of belt conveyors. Adhering to the original idea of confining the studies to the mining conditions where either track or belt can be used to advantage but making their reports comprehensive within these limits, each committee is to cover transportation under the following twelve sets of conditions: in 3-ft., 4-ft. and 6-ft. seams, operating on 2 per cent and 4 per cent grades, both for and against the loads. Estimates for equipping, operating and maintaining gathering haulage under these conditions contemplates mining a panel to completion which means that the labor includes not only the installation, but the removal of the equipment.

With the foregoing object in view, the Conveyor Committee prepared its report according to the following general specifications:

(a) A room panel is 2,000 ft. long

with a 200-ft. barrier pillar. It is developed by three entries with rooms 300-ft. long, driven to the right and left.

(b) An 80 per cent recovery is assumed, making the following productions from a room panel: 103,680 tons for a 3-ft. seam; 138,240 tons for a 4-ft. seam and 207,360 tons for a 6-ft. seam.

(c) The production is to be 1,200 tons per shift, or 2,400 tons per day of double shift. A year's operation is to be 250 days, making an annual production of 600,000 tons. In 10 years, this would be 6,000,000 tons.

(d) For 4-ft. and 6-ft. seams, the Conveyor Committee assumes that one room panel will produce 1,000 tons per shift and a set of three entries on development would produce 200 tons. For 3-ft. coal, two room panels and one panel on development will be needed for the tonnage —See mining plan below.

(e) Equipment is to be depreciated on a 10-year basis except for belts which are to be replaced in five years. Interest charges are figured at 3 per cent and the supply cost for maintaining the equipment (except for the belts) is taken at 10 per cent of the purchase cost, applied over the 10-year period. Prices for material and equipment are as of March, 1947.

(f) Costs will be estimated for 30-in. belts, 4 ply with ⅛-in. top and 1/32-in. bottom. All conveyors are to be extendable to 2,000-ft. centers and the estimate will include for this length, all intermediate conveyor sections complete with supporting framework, stands, trough idlers and return idlers. Each conveyor unit is to have complete terminal and drive equipment, including boom section, drive with motor and controls, take-up and tail section.

(g) Power is 250 VDC and estimated at 2c per kwh. Motors are to be splashproof, compound wound, 1,750 rpm@230 VDC, with heavy duty control, magnetic reversing and dynamic braking. (Note: The Power Committee will submit plans and estimates for the conversion and line equipment.)

(h) Labor rate is $1 per man hour.

Using the above general specifications, three Conveyor Subcommittees have prepared estimates for belt installation and operation in varying seam heights and grades as summarized and covered in the detailed reports.

Total Costs Taken from Tables on Following Pages

SUMMARY OF COSTS PER TON FOR BELT GATHERING IN A 4-FT. SEAM

Grades	Plus 2%	Plus 4%	Minus 2%	Minus 4%
Depreciation	$.0102	$.0104	$.0099	$.0094
Interest	.0003	.0003	.0003	.0003
Power	.0100	.0100	.0060	.0050
Supply	.0052	.0053	.0052	.0051
Labor	.0084	.0084	.0084	.0084
Total	$.0341	$.0344	$.0298	$.0282

SUMMARY OF COSTS PER TON FOR BELT GATHERING IN A 6-FT. SEAM

Grades	Plus 2%	Plus 4%	Minus 2%	Minus 4%
Depreciation	$.0102	$.0104	$.0099	$.0094
Interest	.0003	.0003	.0003	.0003
Power	.0100	.0100	.0060	.0050
Supply	.0052	.0053	.0052	.0051
Labor	.0057	.0057	.0057	.0057
Total	$.0314	$.0317	$.0271	$.0255

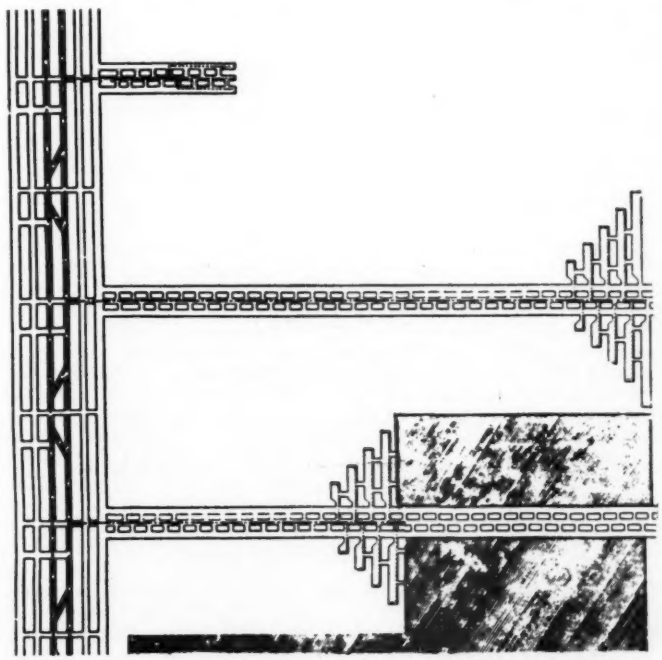
SUMMARY OF COST PER TON FOR BELT GATHERING IN A 3-FT. SEAM

Grades	Plus 2%	Plus 4%	Minus 2%	Minus 4%
Equipment:				
Depreciation	$.0206	$.0210	$.0202	$.0195
Interest	.0061	.0063	.0060	.0058
Supplies	.0020	.0021	.0020	.0019
Power	.0072	.0085	.0060	.0052
Labor	.0267	.0267	.0267	.0267
Total	$.0626	$.0646	$.0609	$.0591

Belt Conveyors for Gathering Haulage in a Seam 4 Ft. High

By A. E. Long

In a 4-ft. seam, it is estimated that for a tonnage of 1,200 tons per shift, two operating units will be required; one room panel producing 1,000 tons and one set of three entries on development producing 200 tons. A total length of 3,000 ft. of conveyor is estimated for the two units, contemplating that the belt will be transferred from the retreating room panel as the entry development advances. On this basis, the equipment cost covers 3,000 ft. of conveyor complete with struc-



A typical conveyor gathering operation with two producing panels and one developing

ture frame, etc., and with two driving sections and two sets of terminal units. The total life of the equipment is estimated at 10 years, but a belt is calculated to last five years and in the tabulation, it will be noted that the replacement belt is included as a part of the supply cost. Each conveyor is estimated to handle an average load of 200 tons per hour with a belt speed of 400 ft. per minute, requiring drives of the following horse power for the various grades:

Plus 2 per cent grade against the loads—This means a vertical lift of approximately 40 ft. in a 2,000-ft. conveyor length, which is estimated to require a 50 hp motor and a belt of 32-oz. duck.

Plus 4 per cent grade against the loads—This means a vertical lift of approximately 80 ft. in a 2,000-ft. conveyor length, which is estimated to require a 50-hp motor and a belt of 36-oz. duck.

Minus 2 per cent grade with the loads—This means a vertical drop of approximately 40 ft. in a 2,000-ft. conveyor length, which is estimated to require a 30-hp motor and a belt of 32-oz. duck.

A gathering belt on a room entry

Minus 4 per cent grade with the loads—This means a vertical drop of approximately 80 ft. in a 2,000-ft. conveyor length, which is estimated to require a 25-hp motor and a belt of 32-oz. duck.

ESTIMATED COST OF GATHERING BELT CONVEYOR FOR A 4-FT. SEAM
Submitted by A. E. Long

The Equipment Costs Also Apply to a 6-Ft. Seam

Estimate for Plus 2 Per cent Grade

Equipment Cost:

2 terminal units, 50 hp, complete with reversing controls	$14,700
6,030-ft. 30-in. belt 4-ply, 32-oz. @ $4.61	27,798
2,955-ft. belt steel (idlers, etc.) @ $6.40	18,912
Total cost of equipment	$61,410

Depreciation: $= \frac{\$61{,}410 \text{ Equipment Cost}}{6{,}000{,}000 \text{ tons}}$ ..... $.0102 per ton

Interest: 3% of $61,410 $= \frac{\$1{,}842}{6{,}000{,}000 \text{ tons}}$ ..... $.0003 per ton

Power Cost: 2 motors @ 50 hp = 100 hp or 75 hp average load

$\frac{75 \times .746}{75\% \text{ Eff.}} = 75$ kw @ 2c per kwh = $1.50 per hr.

16 hrs. @ $1.50 $= \frac{\$24.00 \text{ per day}}{2{,}400 \text{ tons}}$ ..... $.0100 per ton

Supply Cost:

6,030-ft. belt replacement, in five years	$27,798
10% of $33,612 (terminals and steel)	3,361
Total supply cost	$31,159

Total supply cost $= \frac{\$31{,}159}{6{,}000{,}000 \text{ tons}}$ ..... $.0052 per ton

The Following Estimates Are Calculated by Same Formulae as Given Above

	Plus 4%		*Minus 2%*		*Minus 4%*	
Terminals	2 @ 50 hp	$14,700	2 @ 30 hp	$12,860	2 @ 25 hp	$ 9,800
Belts	6,030 ft. 36-oz.	28,703	6,030 ft. 32-oz.	27,798	6,030 ft. 32-oz.	27,798
Idlers	2,955 ft.	18,912	2,955 ft.	18,912	2,955 ft.	18,912
Equipment Cost		$62,315		$59,570		$56,510
Depreciation 10%	$.0104 per ton		$.0099 per ton		$.0094 per ton	
Interest 3%	$.0003 per ton		$.0003 per ton		$.0003 per ton	
Supplies:						
Belt Replacement		$28,703		$27,798		$27,798
Steel Parts		3,361		3,177		2,871
Total Supplies		$32,064		$30,975		$30,669
	$.0053 per ton		$.0052 per ton		$.0051 per ton	
Power—Average	75 hp = 1,200 kwh		45 hp = 720 kwh		37½ hp = 600 kwh	
	$.0100 per ton		$.0060 per ton		$.0050 per ton	

Labor Costs—For All Grades

1 man greasing and maintaining belts $= \frac{\$8.00}{2{,}400 \text{ tons}} =$ $.0033 per ton

Moving and setting up, 700 man hours $= \frac{\$700}{138{,}240 \text{ tons}} =$ .0051 per ton

Total labor ..... $.0084 per ton

Belt Conveyors for Gathering Haulage in a Seam 6 Ft. High

By Robert Fletcher

It appears that for the purpose of this estimate the problem of the 4-ft. and the 6-ft. seams are similar. On that basis the same specifications would apply to both installations and the cost would be the same except for the item of labor cost for moving and setting up. For the 6-ft. seam, because of easier conditions due to the greater working height, we can reduce the time for moving and setting up the conveyor in a panel to 70 man shifts or 490 man hours. With the greater tonnage recovery per panel due to the thicker coal—207,360 tons—the labor cost would be further reduced and is estimated at $.0057 per ton. With this exception, the figures in the summary tabulation are similar to those for the operation in the 4-ft. seam.

Belt Conveyors for Gathering Haulage in a Seam 3 Ft. High

By C. W. Thompson

In a 3-ft. seam, it is estimated that for a tonnage of 1,200 tons per shift, three operating units will be required; two room panels each producing 500 tons and one set of three entries on development producing 200 tons. A total length of 4,000 ft. of conveyor is estimated for these three units, contemplating that the belt will be transferred from one unit to another as

the panels advance and retreat. On this basis, the estimate includes one room panel with a 2,000-ft. conveyor, a second room panel and the development panel each having 1,000 ft. of conveyor. A belt is calculated to last five years and in the tabulation it will be noted that the estimate contains the installation cost of two belts for each unit. The conveyor capacity is assumed at an average load of 150 tons per hour with a belt speed of 300 ft. per minute. This will require drives of the following horse power for the various grades:

Plus 2 per cent grade against the loads—This means a vertical lift of approximately 40 ft. in a 2,000-ft. conveyor length, which is estimated to require a 40-hp motor and a belt of 32-oz. duck.

Plus 4 per cent grade against the loads—This means a vertical lift of approximately 80 ft. in a 2,000-ft. conveyor length, which is estimated to require a 40-hp motor and a belt of 36-oz. duck.

Minus 2 per cent grade with the loads—This means a vertical drop of approximately 40 ft. in a conveyor length, which is estimated to require a 25-hp. motor and a belt of 32-oz. duck.

Minus 4 per cent grade with the loads—This means a vertical drop of approximately 80 ft. in a 2,000-ft. conveyor length, which is estimated to require a 25-hp motor and a belt of 32-oz. duck.

—Discussion—

Presented at the Conference of the Coal Division, Pittsburgh, November 19, 1947.

S. E. Taylor: I would like to raise the question as to whether a five-year life is a representative average for belts used in gathering. Different mines have entirely dissimilar belt experiences; one mine that I know of replaced a 4,000-ft. belt after 9 months' service, while another has all its original 13,000 ft. of belt still in good condition in its seventh year of operation. Our field service reports show that underground belts do not give satisfactory service with only 1/32-in. back cover; a 1/16-in. back is better balanced so that the top and back wear out more nearly at the same time.

A. E. Long: I am inclined to agree that a 1/16-in. back cover will perhaps give better service, especially under certain conditions. However, in considering the general subject of belt wear, it has been our experience that belts seldom wear out—they fail from abuse.

C. W. Thompson: In reference to belt life, our first belt installation was replaced in nine months. This was due to lack of supervision. Then we started revising our methods. We paid attention to how the coal was loaded on the belt; we kept idlers well greased; we used recording watt meters to show when unnecessary friction from drag, etc., was occurring. This system of inspection and maintenance increased the belt life from 3½ to 8 years—8 years being the present record on a belt still in operation.

R. U. Jackson: The estimate of five years may not represent the actual average life of all belts in use for gathering haulage, but the Committee believes that it does represent the life that should be had with proper maintenance and operating methods.

S. E. Taylor: I am in complete agreement that supervision is an all-important factor affecting belt life, but I think we will all agree that there can exist natural conditions in any mine which would tend to shorten belt life regardless of supervision and maintenance. For example, relative humidity of the mine air is one factor, to say nothing of actual wet conditions in acid mine water.

ESTIMATED COST OF GATHERING BELT CONVEYOR FOR 3-FT. SEAM

Submitted by C. W. THOMPSON

Estimated Cost of Equipment

Grade	Plus 2%	Plus 4%	Minus 2%	Minus 4%
Room panel—2,000-ft. belt				
Terminal and drive	$ 6,950	$ 6,950	$ 6,173	$ 4,900
Intermediates	12,608	12,608	12,608	12,608
Belt (1st 5 years)	18,532	19,135	18,532	18,532
Belt (2nd 5 years)	18,532	19,135	18,532	18,532
Room panel—1,000-ft. belt				
Terminal and drive	6,950	6,950	6,173	4,900
Intermediates	6,304	6,304	6,304	6,304
Belt (1st 5 years)	9,266	9,567	9,266	9,266
Belt (2nd 5 years)	9,266	9,567	9,266	9,266
Development—1,000-ft. belt				
Terminal and drive	6,950	6,950	6,173	4,900
Intermediates	6,304	6,304	6,304	6,304
Belt (1st 5 years)	9,266	9,567	9,266	9,266
Belt (2nd 5 years)	9,266	9,567	9,266	9,266
Rock equipment	3,500	3,500	3,500	3,500
Total investment	$123,694	$126,104	$121,363	$117,544
Cost per year:				
Depreciation 10%	12,369	12,610	12,136	11,754
Interest 3%	3,711	3,783	3,641	3,526
Supplies 10%	1,235	1,261	1,214	1,175
Cost per ton:				
Depreciation	.0206	.0210	.0202	.0195
Interest	.0061	.0063	.0060	.0058
Supplies	.0020	.0021	.0020	.0019

Estimated Power Cost

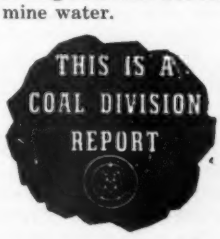
Based on 16 hours continuous per day @ 2c per kwh.

Grade	Plus 2%	Plus 4%	Minus 2%	Minus 4%
Room panel 2,000-ft. belt				
Connected hp	40 hp	40 hp	25 hp	25 hp
Hp used	28.3	31.6	22.3	19.3
Power used per day	453 kwh	506 kwh	257 kwh	309 kwh
Daily power cost	$9.06	$10.12	$7.14	$6.18
Cost per ton	.0033	.0042	.0029	.0025
Room panel 1,000-ft. belt				
Connected hp	40 hp	40 hp	25 hp	25 hp
Hp used	15.6	17.1	12.7	11.2
Power used per day	250 kwh	274 kwh	203 kwh	179 kwh
Daily power cost	$5.00	$5.48	$4.06	$3.58
Cost per ton	.0020	.0022	.0016	.0014
Development 1,000-ft. belt				
Connected hp	40 hp	40 hp	25 hp	25 hp
Hp used	14.3	15.8	11.4	10.0
Power used per day	229 kwh	253 kwh	182 kwh	160 kwh
Daily power cost	$4.58	$5.06	$3.64	$3.20
Cost per ton	.0019	.0021	.0015	.0013
Total cost per ton	.0072	.0085	.0060	.0052

DAILY LABOR FOR MAINTENANCE AND OPERATION

Cost per Ton Based on Production of 2,400 Tons Per Day and a Labor Cost of $1 per Hour

	Number of men	Man hrs. worked	Labor cost
Maintenance	2	16	$16.00
Moving and supplying	4	32	32.00
Roof brushing	2	16	16.00
Labor cost per ton			.0267



WHEELS OF GOVERNMENT

As Viewed by A. W. DICKINSON of the American Mining Congress

THE Second Session of the 80th Congress swung into action January 6, with a tentative program which calls for adjournment by the July 31 statutory date, with two ten-day recesses in mid-June and early July for the Republican and Democratic national conventions. Immediate issues to be considered are the Marshall foreign aid program and income tax reduction. In the five-week special session concluded December 19, the Congress approved the Vandenberg-Connally interim foreign relief bill, providing $540 million for aid to France, Italy, Austria and China. The measure calls for the issuance of regulations by the President, controlling purchase or procurement of relief supplies, which will minimize the drain upon our domestic natural resources and the tendency to increase domestic prices. Forbidden are practices which would in any way control production or prices or allocate deliveries of any commodity within the United States.

Also enacted was an economic controls bill authorizing the President to approve voluntary agreements, with immunity from prosecution under the anti-trust laws, for: allocation of transportation facilities; priority, allocation and inventory control of scarce commodities; and speculation on commodity exchanges. Fixing of prices by such agreements is forbidden and all must expire by March 1, 1949. In administering export controls, which the Act extends to February 28, 1949, the President is authorized "to use price criteria in the licensing of exports, either by giving preference among otherwise comparable applications to those which provide for the lowest prices, or, in exceptional circumstances, by fixing reasonable markups in export prices over domestic prices."

The provision restoring the gold reserve requirement of the Federal Reserve Banks to the former 40 per cent, which had been placed in the bill by House Banking and Currency Committee Chairman Walcott (Rep., Mich.), was eliminated.

State of the Union

Keynoting his "State of the Union" message to Congress with a further request for enactment of the Marshall foreign aid plan, the President also called for extension of the Reciprocal Trade Agreements Act, declaring that this country has led the nations of the world "in bringing about the greatest reduction of world tariffs that has ever occurred." He repeated his request for price, wage and rationing powers in line with his 10-point economic control program, called for a $40 tax credit for each taxpayer and for each dependent and asked for a $3.2 billion corporate tax increase to make up the loss in revenue.

Other legislative requests in the message were for broadened social security coverage and increased benefits; a Fair Employment Practices Commission; a Federal Department of Health, Education and Security; extention of rent control; expansion of reclamation and power projects; 75 cents an hour minimum wage; universal military training; expansion of industrial production activity; and statehood for Hawaii and Alaska.

In discussing natural resources the President stressed the need for accurate and comprehensive knowledge of our mineral resources and said that we must intensify our efforts to develop new supplies and to acquire stockpiles of scarce materials.

Tax

The White House recommendation of a $40 individual tax credit, to be offset by a corporate tax increase of $3.2 billion, was accompanied by a further recommendation in the President's message, that "at least $50 billion should be invested by industry to improve and expand our productive facilities over the next few years." The message made no effort to compose the discrepancy between a $50 billion investment by industry and the contemplated addition to the present heavy taxation burden on corporate earnings, which is today discouraging venture capital for plant expansion and new enterprise.

However, the House Committee on Ways and Means is going right ahead with Chairman Knutson's (Rep., Minn.), bill, introduced December 18, to cut individual income taxes $5.6 billion and strike 7.4 million low-income and elderly persons from the tax rolls.

The bill would increase the present personal exemption of $500 to $600; apply the community property principle to all States; and make 10 to 30 per cent graduated reductions in individual income taxes as follows: (a) 30 per cent for those with incomes after deductions and exemptions not exceeding $1,000; (b) 30 to 20 per cent, on a sliding scale, for those with taxable incomes between $1,000 and $1,396; (c) 20 per cent for those with taxable incomes between $1,396 and $4,000; and (d) 20 per cent on the first $4,000 of taxable income for all others, plus 10 per cent on the tax applicable to the remainder of their income. An additional exemption of $600 is provided for persons 65 years of age and for blind persons. The bill would repeal estate and gift tax provisions which work hardship in present community property States.

In the present session the joint

Washington Highlights

80th CONGRESS: Second session convened January 6.

TAX REDUCTION: Knutson bill ready.

TRADE AGREEMENTS: Extension of law meets opposition.

SOCIAL SECURITY: Regulations pose question.

WAGE-HOUR: Senate hearings anticipated.

ST. LAWRENCE: Drive on for approval.

FREIGHT RATES: 20% interim increase.

Congressional Budget Committee, created by the Legislative Reorganization Act, will make a determined effort to estimate total revenues and thereafter set an over-all Federal spending limit by February 15. Senate Finance Committee Chairman Millikin (R., Colo.), has proposed that the Comptroller General be authorized to prepare a budget for Congress and that the Appropriations Committee staffs be enlarged for the work of budget planning.

A recently issued Treasury study of Federal excise taxes on transportation carries a strong inference that the Treasury sees the existing excise tax on freight as a deterrent to business and as an undue burden to lower-income consumers. The mining industry has consistently maintained that the excessively burdensome transportation tax should be repealed.

Foreign Trade Agreements

The President's proclamation which made effective some of the tariff reductions given by U. S. representatives at Geneva was issued December 16, with the reductions effective January 1, 1948. The proclamation attempted to limit the concessions to the following countries which have signed the Geneva agreement: Australia, Canada, France, United Kingdom and the Benelux (Belgium-Netherlands-Luxembourg) customs union. Actually, under existing law, reductions granted by the U. S. to any foreign nation automatically apply to every other country except those found to be discriminating against U. S. trade. Items listed in the proclamation on which the concessions will not become effective January 1 include antimony; antimony oxides; some types of mica; some types of scrap iron and steel with a high vanadium, tungsten, molybdenum or chromium content; tungsten ore and concentates; low carbon ferromanganese; copper ore, concentrate, matte, blister, refined and old scrap; aluminum; and nickel.

Sharp criticism of the Administration's tariff procedure portends definite opposition to extension of the reciprocal foreign trade agreements authority, in its present form, by the House and Senate this spring.

Social Security—Employes

Chairman Harold Knutson and his Committee on Ways and Means have under consideration the tentative regulations of the Bureau of Internal Revenue, made public November 27, defining who are employes and therefore subject to Social Security taxes. Following the filing of protests with the Bureau of representatives of a number of mining companies, Knutson warned the Commissioner that the proposed regulations appear to extend "far beyond any coverage intended by Congress." He called representatives of the Bureau and of the Social Security Board into an executive session of the Ways and Means Committee and public hearings may be announced shortly. Meanwhile, the Bureau has postponed the effective date of the regulations from December 27 to February 1.

This matter is of importance in mining areas where the practice of "block-leasing" or other similar leasing arrangements is followed. The Bureau states that, based on recent Supreme Court decisions, the determination of who are employes involves a number of considerations, including: (1) the social purposes of the law; (2) whether the individual, as a matter of economic reality, is dependent on the business to which he renders service or on his own business; (3) the total situation in the case must be looked to, and no one factor governs; and (4) among factors which are to be used in conjunction with the foregoing principles, are: degree of control over the individual performing services; permanency of relation; integration of individual's work in the business to which he renders service; skill required; investment by the worker in facilities for work; and opportunities of the worker for profit or loss.

Robert M. Searls, Counsel for the California Chapter of the American Mining Congress, in protesting to the Commissioner, stated that if the Federal Government desires to extend the coverage of the Social Security Acts to include independent contractors (leasers), "we respectfully suggest that it should be made through congressional amendment to the existing law and not by an administrative expansion of the traditional legal definition of employer-employe relationship. As you are probably advised, the class of mine lessees to whom I have referred have been held by the Supreme Court of this state and by the Circuit Court of Appeals for the Ninth Circuit to be independent contractors not subject to either state or Federal Social Security taxes. Neither the lessees nor the mine owners desire any such coverage, and if your department feels, nevertheless, that it should be made mandatory, we respectfully request that your recommendations be presented through Congress instead of being incorporated in new administrative definitions."

Wage-Hour

Further action on amendment of the Wage-Hour Act, with a possible increase in the 40-cent minimum wage, now awaits determination of policy by congressional leaders. The McConnell (Rep., Pa.) House Labor Subcommittee has concluded its hearings, discussed in the December JOURNAL, and a report is now being written. The Senate Committee on Education and Labor may shortly announce hearings

(*Continued on page* 61)

"Too bad you didn't hear the whole story about that gold in the ground!"

Personals

C. F. Kelley, chairman of the Board of Anaconda Copper Mining Co., has announced the following changes in the Geological Department, which became effective as of January 1, 1948:

Reno H. Sales, chief geologist of the company, has asked to be relieved from active duty. Although he retires from the performance of his active duties and responsibilities, the services of Mr. Sales will be retained by the company in the capacity of consulting geologist, in particular devoting his time to the investigation and study of ore deposits.

Reno H. Sales

Mr. Sales has been continuously employed by the company since his graduation from Columbia University in 1900, and has been chief geologist for the past 41 years. Under his guidance the geological work at the company's operating mines has been brought to its present high standards. He has been chiefly responsible for the introduction and development of geological field and office methods and practices which are now widely accepted.

Vincent D. Perry

Vincent D. Perry, who has been assistant chief geologist in charge of outside exploration, is appointed chief geologist and will have headquarters in New York City.

Murl H. Gidel, now assistant chief geologist in charge of the Geological Department in Butte, will supervise the geological work in all the company's operating mines in North America.

Chester H. Steel, Mr. Gidel's assistant, will have charge of the Geological Department in Butte.

Alex McDonald, who has been Mr. Perry's assistant, will have charge of outside exploration work in western United States.

George A. Roos, of Pottsville, Pa., formerly general manager of the Philadelphia & Reading Coal and Iron Co., was recently elected vice president in charge of the company's operations. He began his service with the company early in 1904. He advanced steadily to assistant general manager in 1928, and nine years later, in 1937, was named general manager, which position he held until he assumed his present post.

D. J. "Judge" Parker, retired recently as supervising engineer of the U. S. Bureau of Mines' safety station at Birmingham, Ala., after more than 33 years of Government service. He became associated with the Bureau in 1914 and during his career has done much to advance the cause of mine safety. He has been succeeded by **Milton C. McCall**, who was formerly engineer in charge of the Johnstown subdistrict office of the Bureau of Mines Coal Mine Inspection Division.

Rowland King, Spokane manager of the Sunshine Mining Co., and a former operator of the Crescent manganese mine for the Sunshine exploration department, has been elected president of the Northwest Mining Association for 1948. Other officers are **J. E. Berg**, general manager, Federal Mining & Smelting Co., Wallace, Idaho, vice president; **Charles C. Robbins**, long-time operator at Republic, Wash., treasurer, and **Roger O. Oscarson**, Spokane, managing secretary.

Dr. P. G. Agnew, who for the past 28 years has served the American Standards Association as secretary and head of the staff, gave up his administrative duties on January 1, and the board of directors appointed **Vice Admiral George Frederick Hussey, Jr.**, U.S.N. (Ret.) as secretary. **Cyril Ainsworth**, who for a number of years has been in charge of the technical activities of the ASA, has had his duties and responsibilities expanded as director of operations of the ASA staff.

Calumet & Hecla Consolidated Copper Co. has announced the election of three vice presidents, effective January 2, 1948. They are **A. E. Petermann**, general counsel; **A. H. Wohlrab**, general manager of the Calumet Division; and **H. Y. Bassett**, general manager of the Wolverine Tube Division.

Robert Livermore of Boston retired as vice president on December 31, 1947, but remains as a director.

Robert J. Brison, formerly a field engineer with the Denver Equipment Co., has joined the staff of Battelle Institute, Columbus, Ohio, where he will conduct ore dressing and mineral processing research.

J. B. Warriner, formerly president of the Lehigh Navigation Coal Co.,

J. B. Warriner

Evan Evans

Inc., was elected chairman of the Board, and **Evan Evans**, formerly vice president and general manager, was named president of the company at a meeting of the Board of Directors of the company on December 23, 1947.

Ralph D. Parker and **J. Roy Gordon**, of Copper Cliff, Ontario, and **Herbert G. Fales**, of New York, have been elected assistant vice presidents of the International Nickel Co., Ltd., **Robert C. Stanley**, chairman and president, recently announced.

At the same time Mr. Stanley announced the election of **Walter C. Kerrigan**, **James F. McNamara** and **T. H. Wickenden** as vice presidents of the company's United States subsidiary, the International Nickel Co., Inc.

A. E. Spotti, formerly production engineer of the Pursglove mine of Pittsburgh Consolidation Coal Co. (West Virginia), has recently been appointed general mine foreman of the Arkwright mine of the same company.

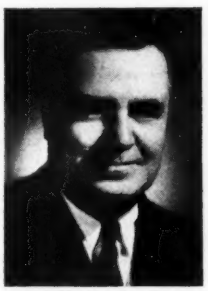
E. E. Littler, purchasing agent, Anaconda Copper Mining Co., retired on January 1, 1948, and was succeeded by **A. Baird Harris, Jr.**

Mr. Littler had been employed by the company for 48½ years and had been purchasing agent since 1925. His loyal and efficient services have been

highly appreciated by the company and his personality and ability have won for him merited recognition and many friends in the field of purchasing and elsewhere. Before World War II, Mr. Harris was purchasing agent for the International Business Machines Co., he served three years in the United States Army, attaining the rank of lieutenant colonel, and for the past two and one-half years has been assistant purchasing agent.

Don Hinckle, recently associated with the Battelle Memorial Institute of Columbus, has joined the staff of engineers of the New York Coal Sales Co. He is specializing in the preparation of coal at all of the company's mines.

Joel M. Bowlby, president of The Eagle-Picher Company of Cincinnati Ohio, has been elected to the Board of Directors of the Federal Reserve Bank of Cleveland, for the unexpired term ending December 31, 1948.



Joel M. Bowlby

Mr. Bowlby, a native of Litchfield, Ill., has been at the head of The Eagle - Picher Company since 1941. He began his business career with Railway Steel - Spring Company, now a division of American Locomotive Company. After eight years of varied experience in the commercial and investment banking business, he served in the U. S. Army during World War I, both at home and abroad. At the conclusion of military service, he was assigned to the U. S. Liquidation Commission, and subsequently, appointed Chief of the Machine Tool Section, Office of Director of Sales, U. S. War Department.

In 1921, Mr. Bowlby became associated with Barrow, Wade, Guthrie & Company, accountants and auditors, and remained a general partner of that firm until 1941, when he assumed the presidency of The Eagle-Picher Company.

L. R. Jackson was recently named superintendent of stripping operations for the DeBardeleben Coal Corp. at Sipsey, Ala. He supervised several operations for the English during World War II.

Otto T. Englehart of Washington, D. C., an attorney, has been elected president of the Beryllium Corp., according to Richard M. Quimby, the company's secretary. Mr. Englehart was counsel and vice president of the corporation. For 12 years he was a special assistant to the United States Attorney General.

C. A. Quenon has succeeded **H. H. Blackburn** as general manager of the Clear Creek Coal Co., Clearco, W. Va. He was formerly a superintendent for the company. Blackburn retired after more than 17 years of service with the organization in the capacity of general manager.

Robert W. Richardson has been appointed to the newly created position of commercial research engineer for the Calumet and Hecla Consolidated Copper Co. Prior to joining Calumet and Hecla he was associated with Sanderson and Porter, consulting management engineers of New York. He is making his headquarters at the general offices of the company at Calumet, Mich.

— *Obituaries* —

Harold G. Moses, 63, general shovel foreman of Chino mines, Kennecott Copper Corp., at Hurley and Santa Rita, N. Mex., died of a heart attack December 2. He started his mining career in 1909 with Chino and served continuously with this company except for two years during World War I, when he enlisted in the U. S. Army Engineers and saw service overseas.

Eugene Ireland died at Bishop, Calif., on November 10 following a heart attack. During recent months Mr. Ireland had been employed by the Tungstar Mining Co. to design and erect its milling plant. He was well known in Arizona mining circles, particularly in Mohave County, where he was associated with the Goldroads property, the Tom Reed Gold Mining Co., and the Katherine mill. He spent three years in Africa, in the mid-1930's, and immediately prior to the outbreak of World War II was directing mining operations in Nicaragua.

J. J. Coan, president of the J. J. Coan Machinery Co., Salt Lake City, Utah, passed away recently. Mr. Coan was well known as a mine owner, contractor and dealer in mining machinery. He was 79 years old.

Edwin C. Sutton, well known Colorado mining engineer, died in Leadville Hospital of injuries suffered in a fall at his home in Breckenbridge. Mr. Sutton was born in Bartlett, England, December 23, 1868. A graduate of London School of Mines, he had previously served as a member of the King's Guard. He came to the United States in 1892 as a mining engineer. He managed mines in Cripple Creek and Victor until 1910, when he moved to Summit County, where he became manager of the St. John's extension mine.

Frederick P. Huston, engineer and metallurgist in the development and research division of the International Nickel Co., Inc., at New York, died at the Muhlenberg Hospital, Plainfield, N. J., on December 29, from a heart attack he had suffered recently at his home, Fanwood, N. J. He was 57 years old.

Mr. Huston was in charge of developments in the application of nickel alloys in the railroad field for International Nickel's development and research division. He had been with the company for over 20 years, having joined its technical service section in October, 1927. Previous to his appointment as head of the division's railroad developments in February, 1945, he had been associated with the I.N.C.O. mill products division for about five years.

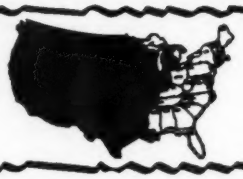
J. Rogers Flannery, 68, a pioneer in the production and refining of vanadium, died at Pittsburgh, Pa., on Friday, December 26. Mr. Flannery organized the American Vanadium Co. in 1906 and continued as its head for 16 years before selling his interest. The firm refined Peruvian ore at a plant in nearby Bridgeville, Pa. The company is now the Vanadium Corp. of America.

Richard J. Evans, well-known Utah mining man, died in Salt Lake City on December 3. Born in Greenwich, Mich., on January 27, 1865, he obtained his first mining experience at the age of 16 working in the Calumet and Hecla copper properties. He graduated from the International Commercial College at Saginaw, Mich., in 1887 and thereafter engaged in teaching and newspaper work until 1896, when he moved to Utah, and where he immediately became active in mining again. He organized Modoc Mining Co. and later was associated with the Silver King and Creole mines, the California-Comstock mine, the Montana-Bingham mine, the Standard copper mine, and assisted in the organizing of the Bingham Copper Co. He also helped develop the Primrose mines, Tinctic Mining Co. and others. Mr. Evans was interested in construction work and coal mining. He was for many years a member of the American Mining Congress.

Arthur P. Van Gelder died December 10 at a Wilmington, Del., hospital. He was widely known in the explosives industry, having retired as general superintendent of high explosives of Hercules Powder Co. in 1921. Following retirement he collaborated with Hugo Schlatter to compile the book "History of the Explosives Industry in America."

NEWS and VIEWS

Eastern States



Republic Steel Purchases Two Coal Firms in West Virginia

Republic Steel Corp. has announced the purchase of two West Virginia companies producing low volatile Pocahontas coal to ease the company's shortage of this fuel.

The two coal producing firms, Standard Fire Creek Coal Co. and Fire Creek Fuel Co. of Beckley, W. Va., own and operate mines at Beelick Knob and Jon Ben, W. Va. Together they comprise about 2,500 acres of Pocahontas No. 4 and No. 6 coal.

Carter Mines Resume Operation

The mines of the Carter Coal Co., closed since last June, are now under new ownership and have resumed operation.

The Carter properties were reopened shortly after Frank Purnell, president of the Youngstown Sheet and Tube Co; Leigh Willard, president of the Interlake Iron Corp.; and H. G. Hilton, president of the Steel Co. of Canada, Ltd., announced the purchase of all of the stock of the Carter Coal Co. by a group associated with the companies named.

New officers of the Carter Coal Co. are as follows: Mr. Purnell, chairman of the board; Mr. Willard, president; Mr. Hilton, vice president; Henri P. Junod, of Cleveland, vice president; A. C. Joachim, of New York, secretary and treasurer; H. J. Muller, of New York, comptroller; Elizabeth Miller, of New York, assistant secretary.

In addition to Messrs. Purnell, Willard and Hilton, directors of the company are Elton Hoyt II, of Cleveland; J. L. Mauthe, of Youngstown, and E. L. Clair, of Cleveland. Operations will be under the supervision of the present organization of the Carter Coal Co.

Mr. Purnell stated that the purchasing group had become interested in acquiring the stock of Carter Coal Co. primarily to maintain for the future this important source of low volatile coal which it has been buying from the Carter operation for many years past and which has recently been interrupted. Mines involved are the two Olga operations at Coalwood, W. Va., and Caretta mine on War Creek, in West Virginia, all on the rails of the Norfolk & Western Railway, with a combined capacity in excess of 3,000,000 tons a year.

Concurrent with the wind-up of negotiations for the sale of the properties, necessary transaction with union officials to permit immediate reopening of the mines were undertaken. Production has been resumed at all three mines. It was expected that some time before the end of December Carter output would have attained its normal volume.

Cameo Mine Sold

The Cameo Coal Mining Co., of Cameo, W. Va., has been purchased by Clifford L. Fishback, president of the Michigan & Southern Coal Corp. and vice president of the Elk River Coal & Lumber Co. The Cameo mine produces No. 5 block seam with a daily production of about 1,300 tons and is located on the C. & O. Railway.

The following directors of the company were elected: Clifford L. Fishback, Columbus, Ohio; Wayne P. Ellis, Columbus, Ohio; Frank P. Smith, Huntington, W. Va.

Officers elected for the ensuing year are: Clifford L. Fishback, chairman of the board and secretary; Frank P. Smith, president; and Wayne P. Ellis, vice president and treasurer.

Anthracite Institute Launches Advertising Campaign

An advertising campaign designed to inform the 5,000,000 anthracite users in the northeastern part of the country of the availability of the product during the current winter has been launched by Anthracite Institute. The campaign, involving expenditures of approximately $650,000 for 1948, will be primarily in newspapers in the major anthracite markets, with smaller campaigns in consumer magazines.

Major purpose of the program is to inform the public of anthracite's favorable supply situation and to help consumers make the best use of anthracite.

In support of its claim to the new homes and house improvement market, the magazine campaign will feature equipment and product. Architectural, building and plumbing trade press will be used as well as the coal trade press.

An extensive promotional program to coal dealers, architects and builders will supplement the advertising phases of the program.

In initiating the anthracite cam-

L. E. YOUNG
Consulting Engineer
Mine Mechanization
Mine Management
Oliver Building Pittsburgh, Pa.

paign, Institute officials stressed that there is sufficient hard coal to meet current demand and there need be no cold homes among its users this winter.

Small-home owners will be urged, via the campaign, to consult their dealers as to the best methods of getting maximum heat with present equipment and locally available sizes.

"This advertising campaign," Institute officials said, "is planned as continuing feature of the industry, to emphasize current and long-range advantages of anthracite as a home-heating fuel."

New West Virginia Mines Opened

The C. H. Mead Coal Co. recently announced that it is opening two new operations on property leased on Stonecoal Creek.

W. B. Sweazy, general superintendent, said that one of the two operations would be a drift mouth mine to be called East Gulf No. 4 and from which it is hoped that slightly more than 2 million tons of coal can be taken from the Pocahontas No. 4 seam. He indicated that it would be necessary to use hand loading operations at this mine for about eight months.

A stripping operation is scheduled to go into operation about April 15.

The company also expects to step up production at its three other mines from the present rate of 3,000 tons per day to 3,500-4,000 tons.

New Jersey Zinc Seeks New Mines

The New Jersey Zinc Co., New York, has announced the formation of two new subsidiaries—the New Jersey Zinc Exploration Co. and Valley Mining Co. Both are wholly owned and were formed primarily for prospecting and exploration. Operations of the exploration company will include all types of mining ventures and provision is made for mining, milling, smelting, processing, manufacturing and selling of any of these materials. Valley Mining Co., formed for the purpose of prospecting in various sections of Canada, was incorporated in Quebec and is also registered in the Province of British Columbia.

Koppers Expands Coal Research

A greatly enlarged program of research in 1948 in the development of processes for making synthetic liquid fuels and other chemicals from coal will be undertaken by Koppers Co., Inc., Gen. Brehon Somervell, president, recently announced.

In the year ahead Koppers will also continue to devote a large amount of research effort to the development and improvement of the company's chemical products.

The company's chemical division showed outstanding growth in 1947, starting production of a number of important chemicals for industry and adding three plants to the operations of that division.

New facilities for producing polystyrene, a widely used plastic material, and other chemicals, are under construction at Kobuta, Pa., and will be put into operation in the first half of 1948, Somervell said.

The full effect of the expansion program of Koppers' chemical division may not be felt until the latter half of 1948 when new operations come into production, he added.

Sharon Steel Acquires Coke Plant

Sharon Steel Corp. has bought a large by-products coke plant at Fairmont, W. Va., which will help solve its acute coke shortage problem and sharply increase steel output, President Henry A. Roemer has announced.

The plant, including 65 ovens with an output capacity of 25,000 tons of coke monthly, was bought from Standard Oil Co. of New Jersey. Mr. Roemer said Sharon will take over this month.

It is understood that output of the Fairmont plant, plus that from some beehive coke ovens operated by Sharon at Carpentertown, Pa., will nearly supply coke needs of Sharon's three Youngstown district blast furnaces.

The coke from the Fairmont plant is expected to help Sharon to increase substantially its iron and steel output.

New Railroad Spur to Aid Leatherwood Coal Field

Recently the Louisville & Nashville Railroad Co. announced subject to the approval of the Interstate Commerce Commission, plans to construct a 5½-mile railroad spur into the heart of the Leatherwood coal field in west Kentucky.

Simultaneously Huston St. Clair, president of the Jewell Ridge Coal Corp., and R. H. Kelly, president, Fourseam Coal Corp., announced that their respective companies had ratified a lease agreement with the Kentucky River Coal Corp., of Lexington, Ky., for the construction and opera-

"Who don't we miners get along with these days?"

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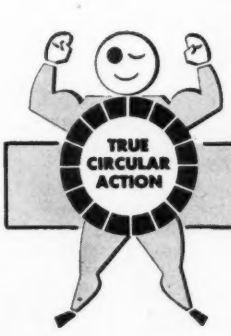
Our greatly expanded facilities now make it possible for you to obtain prompt delivery on standard or special models of Seco Vibrating Screens, the only vibrating screens with fully controlled true circular action. Send your problem today! Dept. K.



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SECO

SCREEN EQUIPMENT COMPANY, INC.
PRODUCERS OF VIBRATING SCREENS EXCLUSIVELY
Buffalo 21, New York
In Canada: United Steel Corp., Ltd., Toronto

tion of a modern, wholly mechanized mining plant with a daily capacity of 8,000 tons in the Leatherwood field.

This new operation plans rapid development and Mr. St. Clair and Mr. Kelly stated that their companies are erecting a joint tipple near the heart of Blair Fork of Leatherwood which will receive coal from both sides of the valley. The mines will have a joint capacity of 160 railroad cars per day, and will be equipped with cutting machines, mechanical loaders, and shuttle cars.

An innovation of the new Blair Fork mine is that its cleaning and preparation plant will be located distant from the mine. The site chosen is the classification yards of the Louisville & Nashville Railroad Co., at Ravenna, Ky., where a modern central cleaning and preparation plant is to be constructed with a capacity for handling 10,000 tons per day.

Rochester & Pittsburgh Acquires Christopher Mining Co. Mine

The Rochester & Pittsburgh Coal Co. has acquired the No. 6 Mine of the Christopher Mining Co. at Four States, Marion County, W. Va., in a deal involving several million dollars, according to a recent announcement by company officials.

The Christopher interests purchased the mine in 1943, after it had been idle for 12 years, from the Colonial Trust Co. It has been producing approximately 60,000 tons a month.

Record 1947 Coal Production Cited by George H. Love

One of the outstanding jobs in this country during 1947 was that done by the coal industry and its mine workers, aided by the railroads, in meeting the essential needs of an unprecedented world-wide demand for coal, George H. Love, president, Pittsburgh Consolidation Coal Co., declared in a year-end statement.

He said: "This record peacetime output, exceeding 600 million tons, was produced without major additions to the industry's deep mine capacity, with a 1¼-hour reduction in the working day during the latter half of the year, and despite the difficulties caused by greatly overtaxed transport facilities.

"If this country is called upon to face another emergency, coal, which the United States has in such abundance, will in all probability have to carry an even greater part of the total energy load. Therefore, it is in order for all major users of energy to give serious consideration to this fact in making their long range fuel plans.

Central States

"Coal Speaks"

Appalachian Coals, Inc., is sponsoring a radio news program entitled "Coal Speaks" over about 65 stations in fourteen states five evenings each week, Monday through Friday. The programs present specially written commentaries about the most important news of each day and give factual information and authoritative views about coal and the coal industry. The theory behind the program is that "A Well Informed Public Is America's Greatest Security."

Latest addition to ACI's network of stations is WCKY (50,000 watts), Cincinnati, 1530 and on the dial at 8 p. m., EST. A complete list of the stations on which this fine program is carried may be secured by writing Appalachian Coals, Inc., Transportation Bldg., Cincinnati, Ohio.

Fletcher Says 15-Cent Lead Price Not Excessive

Lead at 15 cents a pound is not abnormally high, declared Andrew Fletcher, president of the St. Joseph Lead Co., in an address delivered at a meeting of the Mining and Metallurgical Society of America, at the Mining Club in New York City on December 16.

Discussing the U. S. mine production of lead, Mr. Fletcher declared that this country has been the largest producer in the world, furnishing about 25 per cent of the newly mined supply. He doubted, however, whether the U. S. would ever be able to duplicate its record production of the late 20's when "under the stimulus of a price which was even higher from the viewpoint of purchasing power than the present 15 cent price, over 625,000 tons of lead per year were produced for the five-year period 1925 to 1929." In 1946 only 340,000 tons were produced, and this year he estimated production at around 400,000 tons "because our industry has not yet recovered from the damage done by the war through insufficient development work, plus the inefficiency resulting from the Premium Price Plan and the Government control." Mr. Fletcher estimated that in 1948 the U. S. production of newly mined lead should approximate 425,000 tons and this total, he believed, could be maintained for the next few years.

Mr. Fletcher warned, however, against the present hysteria that is developing in the U. S. that governmental controls must be restored. "If they are, then we might again have lead allocation, price control and premium price plans." He urged that Congressmen and Senators be advised about the inefficiency and the inefficient results of Government regulations. Mr. Fletcher stated that when the Fremium Price Plan was terminated on June 30, 1947, he predicted that the production this year would be greater, not less, under free market conditions than it was in 1946 and he was criticized for this prediction.

"I do not believe," said Mr. Fletcher, "that any sizable lead production will be obtained from any so-called 'marginal' mine, which is one that cannot operate at a profit under the prevailing cost-price ratio. Therefore, our stockpile for defense purposes will not be greatly benefited by adoption of another Government subsidy plan for marginal mines."

Referring to zinc Mr. Fletcher said that if the Premium Price Plan had not been terminated "then a lower price than 10½ cents per pound would have been suffered until such time as the surplus metal had been stockpiled." In his opinion the present price of zinc appeared to be low in comparison with other commodity prices.

Returning to lead, Mr. Fletcher stated that more lead is being obtained today through the scrap market than from the mines. He estimated that in 1947 the secondary market output will yield about 425,000 tons, the highest recovery of scrap on record and this total compares with 400,000 tons from the mines. He was of the opinion that the 425,000 tons of secondary lead used in 1947 is probably abnormal, "as the scrap dealers, for whose market foresight I have considerable respect, probably withheld a portion of their purchases until the Government ceiling price of 8¼ cents per pound was removed. I believe that the estimate of 425,000 tons a year from scrap is a reasonable guess, especially in view of the larger tonnage of lead that the miners have released to industry during the last seven years."

Recapitulating, Mr. Fletcher stated that the available lead from U. S. sources can therefore be assumed for the next few years at around 825,000 tons per year of which 425,000 tons will come from the mines and 400,000 tons from scrap.

Turning to the consumption of lead, Mr. Fletcher recalled that during the 1930's consumption in the U. S. had dropped to about 400,000 tons a year. He doubted whether it would ever revert to a similar low figure. It was in this connection that he discussed the price level of the metal saying:

"There is a thought that a high price for lead may be reflected in a lower demand—why then, does the demand continue on the basis of around 1,100,000 tons per year? In my opinion it is because a 15-cent price is not an abnormally high one! We should not forget that in comparison with agricultural products the percentage increase from the 1926 basis is no greater and a similar favorable price comparison can be made with other products."

Mr. Fletcher estimated the 1947 consumption at approximately 1,100,000 tons, which is about the rate for the last seven years.

On the basis of an annual consumption somewhat in excess of 1,000,000 tons and domestic mine output of 425,000 tons and the return from scrap 400,000 tons, Mr. Fletcher pointed out that it would be necessary to import about 175,000 tons of lead or lead in concentrates a year.

In 1947, said Mr. Fletcher, about 150,000 tons of pig lead was imported into the U. S. with Mexico and Canada contributing the greatest share, followed by Peru. The lead content of concentrates, he said, was about 50,000 tons additional.

Dig, Haul & Lift

Sauerman Slackline Cableway powered by 20 hp. motor moves tailings from dump pile to bin on hillside.

The Sauerman Slackline Cableway is a digger, conveyor and elevator all in one. It utilizes a round bottom excavator bucket that is chain-suspended from a carrier running on an inclined track cable and is equipped with a simple dumping device which permits automatic dumping at any pre-determined point along the track cable.

After dumping its load, the empty bucket is carried by gravity back to the digging point. The track cable swings around a central mast or tower in a wide arc, the radius of which may be as much as 1200 ft., and the bucket digs and delivers wherever the operator wishes within the radius.

Ask for Catalog 19-C.

SAUERMAN BROS., Inc.
540 S. Clinton St. CHICAGO 7

Fluorspar Properties at Alcoa Transferred

In a recent announcement the Aluminum Co. of America transferred the fluorspar mining and milling properties at Rosiclare, Ill., from the Aluminum Ore Co. to the Alcoa Mining Co. Both of these organizations are wholly-owned subsidiaries of Alcoa. No change in management or operating personnel will take place under the transfer. W. S. Skeels, works manager at Rosiclare will continue his present duties in charge of operations. Allen B. Williams, president of Aluminum Ore Co., has been made a vice president of the Alcoa Mining Co. in charge of fluorspar operations in addition to his other duties.

Reserve Mining Taconite Project

First step in plans to construct a plant to extract magnetic ore from taconite at the rate of 2,500,000 tons of concentrate annually, will begin next summer. The first step is the construction of a harbor on the north shore of Lake Superior near Beaver Bay, Minn. The plans called for the construction of eight 20-ton ore bridges. Up to six Great Lakes ore freighters will be accommodated at the same time.

Completion of the plant which will process about 7,500,000 tons of taconite each year, is about five years away. Two years will be required to get ready for plant construction.

St. Paul Coke Plant to Continue

Koppers Co., Inc., plans continued operation of its St. Paul coke plant even after the city turns to the use of natural gas this spring, M. T. Herreid, vice president of the company and plant manager, has announced.

The Koppers coke plant, which has furnished manufactured gas to the city of St. Paul without interruption for the past 30 years, faces complete loss of revenue from this source when natural gas is turned into the mains.

"We have been able to make specific agreements with several companies for production of foundry coke on a basis that will allow continued operation of this plant at an expected small margin of profit," he stated. "The plan becomes possible only because of the extreme shortage of coke in the United States. This results from the abnormally high demand for steel and other materials requiring coke in their production. Our plan involves changes in operating policy."

The Koppers vice president said that a major consideration of the company has been to avoid closing down the plant, resulting in loss of jobs for a majority of its personnel. The company now employs approximately 250 persons and of this number more than 100 have been with the St. Paul Koppers' plant for 15 years or longer.

The company's plans for the period of future operation will provide employment for a major portion of its personnel at the plant which has received pay totalling approximately $850,000 annually, Mr. Herreid said.

Warner & Co. Plans Improvements

The board of directors of W. H. Warner & Co. recently approved plans for a $3,000,000 improvement program at its Ohio and West Virginia properties. Karl Marquis, president, W. H. Warner & Co., said plans have been approved to install a washer at Camel run, erect new tipples at Wolf Run and Hurricane operations. Work is to begin immediately and it is estimated that construction will be completed by January, 1950.

Parmanco
MECHANICAL FEED
HORIZONTAL DRILL
WITH TRACTION DRIVE

Ten years of field test has proven that our power-feed design of direct, transmission and worm gearing with two-speed control will not only cut shot hole drilling time in half but also eliminates costly maintenance delays. V-belt drive to the power-feed with an additional ample clutch in that assembly gives absolute control of a drilling speed of two to three feet per minute with a retrieving speed of twenty-four feet per minute.

The Parmanco Horizontal is adapted to all forms of high-wall drilling, will handle a six-inch auger up to a distance of sixty feet or more and, by use of our patented augers with interrupted flights and secondary cutters, will drill an absolutely clean hole with a minimum of torque. It permits the drilling of a controlled-angle hole which makes possible a great saving of explosives through the cantilever effect of this controlled-angle drilled hole.

EFFICIENT STRIPPING STARTS WITH EFFICIENT DRILLING

PARIS MANUFACTURING COMPANY
PARIS, ILLINOIS

New B. & O. Coal Dock Nears Completion

Virtually completed after 19 months of work, the new $4,000,000 coal dock of the Baltimore & Ohio Railroad at Lorain, Ohio, is now being test-operated, and will be ready for general service at the opening of the 1948 shipping season on the Great Lakes, according to the company.

The facility contains modern equipment for the careful transfer of coal from rail cars to the holds of lake vessels. On one of the two piers is located an electrically operated coal dumper capable of picking up a 70-ton loaded coal car, dumping its contents into a chute, and then returning the car to the track so that it may move automatically back to the "empty" yard. This operation can be carried on at the rate of one car per minute.

The two piers of the facility are 1,100 ft. in length, and lie within the breakwater of Lake Erie, adjacent to the mouth of the Black River. The slip between the piers is 22 ft. deep, capable of accommodating the largest coal boats on the Lakes.

The new pier is next to the present B. & O. ore-handling docks, and it will facilitate rapid handling of the great tonnage of coal and ore that passes through Lorain during each shipping season.

Reserve Mining Co. Secures Approval for Taconite Plant

A unanimous vote of approval was given the Reserve Mining Co. of Cleveland, Ohio, to discharge tailings from their proposed taconite beneficiating plant near Beaver Bay, Minn., by the Minnesota Water Pollution Control Commission on December 16.

The commission granted the approval on condition that the waste would not "result in material clouding or discoloration to the water, adversely affect fish life or public water supplies, cause other unlawful pollution of the lake water, interfere with navigation, or constitute a public nuisance outside the vicinity of the discharge."

Hanna Coal Co. to Expand at Georgetown Mine

The Hanna Coal Co., a subsidiary of the Pittsburgh Consolidation Coal Co., has announced plans for enlargement of facilities at its Georgetown mine, known as the largest strip mining operation in the world. A new tipple will be installed with a capacity of 5,000 tons of coal a shift. It will be the fifth tipple at the facility, others having peak capacity of 3,500 tons each.

***It Is Enabling 3 Million Fewer Farmers To Harvest Food From 20 Million More Acres**

War service and war work thinned the ranks of American farmers by 5 million. There still are 3 million fewer farmers than in 1940. Yet, since 1940, farm production has increased one-third.

Hard work and good weather helped. But, this Bunyanesque feat of production could not have been accomplished had it not been for the mechanization of farms.

Without steel, cheap steel, mechanization could not have been brought to the farms and the world would be more than hungry—it would be starved.

Vastly increased farm mechanization has taken place in the last ten years. In that time the composite price of finished steel, as published by Iron Age, has increased only about ½¢ per pound. This modest increase in the base price of steel as obtained by the mill has little effect on the ultimate cost to the consumer of steel products.

Steel is the most essential and the cheapest of all metals.

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Western States

Calumet and Hecla Acquires Acreage

The Tonopah Development Co., subsidiary of the Calumet & Hecla Cons. Copper Co., diamond drilling a large area north and northwest of Tonopah, lately acquired title to 34 patented mining claims owned by Nye County and on which the company held a "prospecting permit" for the last year.

An additional 34 claims were acquired by location, giving the company a block of 68 claims approximately 20 acres each.

The third hole is being drilled and, like the two holes put down previously, is encountering difficulties. The ground is "ravelly," which slows down the operation.

First hole was put down on the old Tonopah King claim and bottomed at 1,500 ft. The second hole was spotted 1,500 ft. west of the first but was abandoned, it is reported, at a depth of approximately 1,200 ft. because of caving ground. The drill rig was then moved back 300 ft. and a third hole started. This hole, however, was said to be giving trouble.

Drilling is under contract to the E. J. Longyear Co., of Minneapolis.

Northwest Mining Association Meets

With a registration of over 600 from 14 states and 2 provinces in Canada, the Northwest Mining Association held its 53rd annual convention at Spokane on December 5 and 6. Headlining the speeches were the luncheon addresses given by Dr. Francis A. Thomson, Butte, president of the Montana School of Mines, and Charles E. Schwab, Kellogg, Idaho, mining engineer and production foreman of the Bunker Hill & Sullivan Mining & Concentrating Co.

Dr. Thomson spoke extemporaneously on the future of prospecting for ore deposits that do not outcrop and predicted that large bodies of minerals will be found by so doing. Mr. Schwab outlined in some detail the plans of his company to block cave some 5,000,000 tons of low-grade ore on the upper levels, this ore assaying about 3 per cent combined lead and zinc and ½ oz. of silver per ton. It was the consensus of opinion that the facts presented by these two gentlemen spelt the death knell of the exponents of the theory that our country is a "have-not" nation in mineral resources. Talks of 1947 developments in the various states and in British Columbia were given by Stephen Green, Division of Mines and Geology, Olympia, Wash.; F. W. Libbey, director, Department of Geology and Mineral Industries, Portland, Oreg.; Frank E. Woodside, secretary, British Columbia Chamber of Mines, Vancouver, B. C.; A. G. Mackenzie, vice president, Utah Mining Association, Salt Lake City; Harry W. Ingalls, editor, *Wallace Miner*, Wallace, Idaho; and Carl J. Trauerman, secretary, Montana Mining Association.

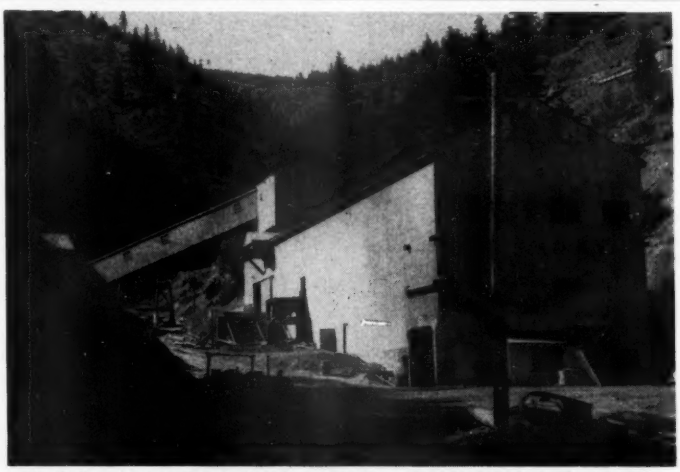
Mayor Arthur Meehan of Spokane and Wray D. Farmin, president, NWMA, gave rousing addresses of welcome.

Roscoe E. Bell, coordinator, western phosphate program for Department of the Interior, and Harry W. Marsh, Boise, secretary, Idaho Mining Association, gave some up-to-date figures on phosphate deposits in the Northwest and outlined the importance of that mineral. Others on the program were Sheldon Glover, Olympia, Wash., supervisor, Division of Mines and Geology; Richard Anderson, Portland, Oreg.; Roy Larson, Spokane, technical advisor, explosive division, DuPont Co.; Frank A. Taft, Colville, Wash., mine superintendent, Consolidated Goldfield Co.; R. S. Hooper, Kellogg, assistant mine superintendent, Bunker Hill & Sullivan; H. A. Myers, manager, Spokane office Western Machinery Co.; and Mrs Viola McMillan, Toronto, Ontario, president, Prospectors and Developers Association.

The strong declaration of policy unanimously adopted by the convention followed closely the declaration adopted by the American Mining Congress at its El Paso meeting, urging free private competitive enterprise; the encouragement of new exploration and development of marginal and low-grade properties; a reaffirmance of the statements of the objects of the association adopted 53 years ago; the establishment of sound currency systems based upon gold and silver throughout the world before our nation enters upon any large-scale foreign lending policy or the distribution of monetary relief; opposing so-called Valley Authorities; favoring the establishment of better public relations for the mining industry; special mining acts by Congress and the various states to simplify primary mine financing, etc. John J. Curzon, Holden, Wash., manager, Chelan Division, Howe Sound Co., was chairman of the resolutions committee, and Hon. Donald A. Callahan, Wallace, Idaho, acted as advisor to the committee. Other members were Wellman Clark, Frank Lilly, Elmer E. Johnston, and D. I. Hayes, Spokane; J. E. Berg and L. E. Hanley, Wallace; Harry W. Marsh, Boise; George Waterman, Seattle; and Carl Trauerman.

New Crushing Unit Operating at Magma Plant

The crushing unit of its new milling plant has been placed in operation by Magma Copper Co., Superior, Ariz. While the mill building proper has been completed, delays in receiving machinery will make it impossible for the entire mill to go into operation until late this spring. The new crushing plant has been designed to handle 200 tons of ore an hour, crushing to minus ⅜ in., in comparison with the old plant whose capacity was 125 tons an hour to minus ¾ in.



The Sidney Mining Co. in the Coeur d'Alenes mills 300 tons of zinc-lead ore daily. Production comes from an ore shoot over 1,000 ft. in length, varying from 5 to 15 ft. in width.

Colorado Mining Association Meeting

The Colorado Mining Association will hold its annual convention at the Shirley-Savoy Hotel, Denver, Colo., on February 5, 6 and 7. The Silver and Gold Banquet will be held on Friday, February 6, and the famed "Sowbelly" dinner on February 7.

For the ladies, a "Sourbelle" dinner will be held Saturday evening, February 7.

Secretary Robert S. Palmer is making arrangements for the meeting and has extended a cordial invitation to mining men to attend and participate in convention discussions and evening festivities.

Kaiser Buys Surplus Coke Ovens and Blast Furnace

Henry J. Kaiser is buying the Ironton and Sunnyside, Utah, coke ovens and blast furnace and hopes to have them in operation by April, Jack L. Ashby, a vice president of the Kaiser interests, has announced.

He is buying the plants from the War Assets Administration for $1,150,000, it was revealed.

Major problems of water supply, transport, power and raw materials "will probably be solved by the first of the year," Mr. Ashby said.

He added that Kaiser will operate the plant on a permanent basis. The plant, he said, would be able to supply about 300,000 tons of pig iron a year.

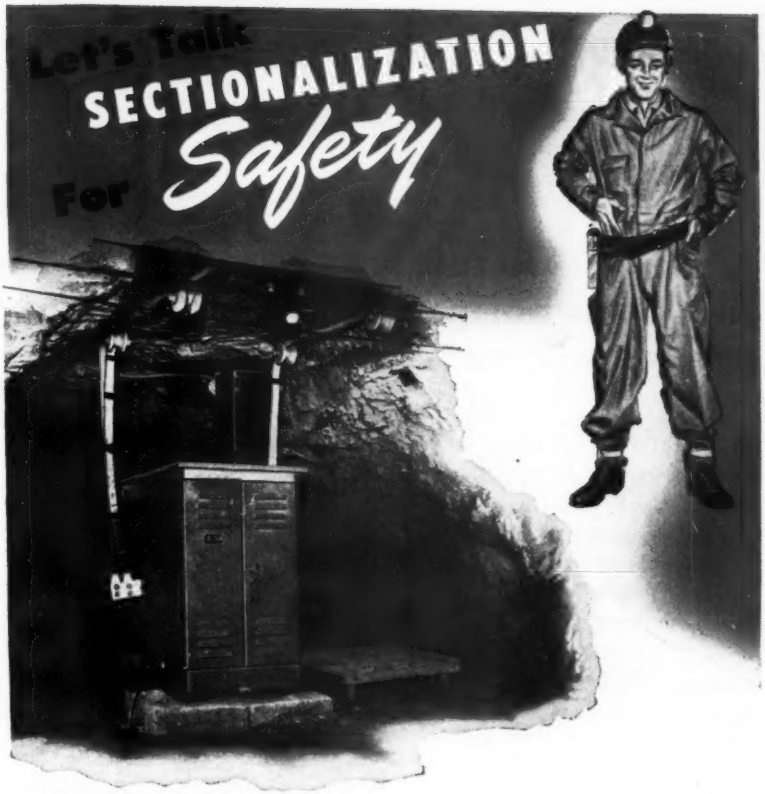
Sierra Mine, Inc., to Construct Mill

Officials of Sierra Mine, Inc., subsidiary of the Goldfields American Development Co., report sufficient ore is now available in the company's property at Bodie, Calif., not far across the Nevada line, to warrant construction of a 500-ton daily capacity mill. The company acquired control of the Standard Cons. and other properties at Bodie in 1945. Construction of the new plant is expected to begin within a short time.

Exploration Work Resumed

Resumption of exploration work and purchase of the property which has been held under lease are planned by the Peckham Hill Gold Mines., Inc., George B. Burnham, president, at its drift gravel mine, containing nearly two miles of lava-covered ancient river channel on Foresthill Divide, Placer County, Calif.

A 3,660-ft. adit to drain the tunnel was completed by the Peckham Hill Co. in 1942. With drainage of water and opening of the channel, gold-bearing gravel was found, but work was discontinued because of the government ban on gold mining.



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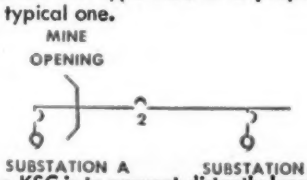
There are a number of applications for the Type KSC in a properly sectionalized mine. Let's consider a typical one.

In the tie-line application at right, the KSC is installed in the circuit between each two substations at a point where the resistance between each station and the circuit breaker is approximately the same. In this case, the function of the KSC is to prevent distantly located stations from feeding into a fault and spreading trouble.



I-T-E Type KSC Automatic Reclosing Circuit Breakers protect your mine in many other ways. Find out how by contacting the I-T-E Mining Specialist in your neighborhood. He will be glad to make an application analysis of your mine electrical distribution system. Use him—at no obligation. I-T-E Circuit Breaker Company, 19th and Hamilton Streets, Philadelphia 30, Pa.

Be Wise SECTIONALIZE

Send for Bulletin 4611 and get complete details on I-T-E Automatic Reclosing Circuit Breakers.

1ST OF A SERIES ON RECOMMENDED SECTIONALIZING PRACTICE USING THE KSC.

I-T-E SECTIONALIZING Switchgear

I'M YOUR MAN

WITH AN AMAZING NEW RATCHET-OPERATED "VIC-GROOVER"!

VIC-GROOVER is a newly developed tool for grooving the ends of pipe to take Victaulic Couplings... and you can get it today!

The handy, ratchet-operated VIC-GROOVER is light-weight for ease of carrying...and it makes its groove at exactly the right spot, to exactly the right depth, *automatically!*

COMPARE VIC-GROOVER with any regular pipe threader and you'll find it takes only half the effort to operate—*and half the time!*

Now it is easier than ever to make your piping system all-Victaulic easily, quickly, cheaply with VIC-GROOVER and Victaulic Couplings and Victaulic Full-Flow Elbows, Tees and other Fittings.

Write today for the "VIC-GROOVER Catalog"!

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EFFICIENT FULL-FLOW FITTINGS SIZES—3/4" THROUGH 60"

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Victaulic, Inc., 727 W. 7th St., Los Angeles 14, Calif.

Victaulic Company of Canada, Ltd., 200 Bay St., Toronto 1

For export outside U. S. and Canada: PIPECO Couplings and Fittings:

Pipe Couplings, Inc., 30 Rockefeller Plaza, New York 20, N. Y.

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Vivian Mining Has New Cyanide Plant

The Vivian Mining Co. has announced the assembly of a 50-ton cyanide plant on their properties, located in the Grass Valley district, should be completed shortly. A lease has been granted to Fred L. Letner on the Finney property near Downieville which Vivian controls. This lease calls for a 20 per cent royalty, work to start at once.

Portales Mining Building Mill

Portales Mining Co., recently organized, is building a 100-ton mill at San Antonio, 11 miles south of Socorro, N. Mex. It is developing the Louis and Halstead copper-lead mines under lease. The mill will also do custom work. Paul Riding is president.

Commercial Utilization of Low-Grade Coal is Research Objective

Commercial utilization of millions of dollars worth of low-grade coal deposits in the state of Washington is the objective of two coordinated research projects of the University of Washington's Engineering Experiment Station, Prof. F. B. Farquharson, director of the station, recently announced.

Dr. Ralph W. Moulton and Dr. Curtis F. Gerald, chemical engineering professors, are directing the investigations.

Dr. Moulton will convert pulverized substandard coal from beds in southwestern Washington into a gaseous fuel to determine if it can be used economically in place of commercial gas now manufactured from oil. Dr. Gerald will explore the possibilities of converting the gaseous fuel into a synthetic liquid with the properties of ordinary gasoline.

After the desired elements are obtained, the two scientists will tabulate data to determine the point of purification necessary for practical commercial use.

Gasification of coal was developed extensively in Germany during the war and is now being studied by numerous research groups in the United States. Each locality has individual problems concerned with varying types of impurities in the coal. The experiments at the University will be the first ever attempted with Washington coal deposits.

Coal mining in the state will receive new impetus if the experiments open a market for deposits of substandard coal. Although reserves of the better grades of coal are still extensive, they are somewhat inaccessible and are becoming economically unavailable. Only 1 million tons of coal were produced in Washington in 1946 as compared with 4 million tons in 1918.

Bullion Gulch to Be Site of New Custom Concentrating Mill

Mining men in the Hailey, Idaho, district, headed by Frank Plugoff and W. R. New, have organized a group for the purpose of building a custom concentrating mill, and started out with $50,000 pledged for the purpose. The plant will be located in Bullion Gulch, where the mill sponsors have leases on a number of old mines which have large dumps of low grade ore that could not be profitably handled at the time the mines were in operation. They claim there is enough of this kind of ore in sight to last a 150-ton milling plant about three years.

El Paso Property at Cripple Creek Closes

El Paso Mines, Inc., has suspended its operations in the Cripple Creek mining district. A statement from Harvey L. Tedrow, general manager in charge of operations, gives the reasons for the shutdown as "the constantly increasing cost of operations and consequent reduction in the purchasing power of gold."

The El Paso mine, which was operated by El Paso Mines, Inc., under bond and lease from Copeland & Knight, owners of the mine and its former operators, was reopened in 1946. About 40 men were employed on the property which is located on Beacon Hill. A majority of them are now said to be employed by other mining operations of the district.

Utah Mining Association Elects Officers

At the annual meeting of the Utah Mining Association, held on December 15, in the association's office, officers for the year 1948 were elected as follows: President, James Ivers, vice president and general manager, Silver King Coalition Mines Co.; vice president, A. G. Mackenzie; second vice president, W. H. H. Cranmer, president and general manager, New Park Mining Co.; third vice president, Paul H. Hunt, vice president and general manager, Park Utah Consolidated Mines Co.; manager, J. K. Richardson.

Directors for the year were elected as follows: T. P. Billings, U. S. Smelting Refining & Mining Co.; W. H. H. Cranmer, New Park Mining Co.; R. C. Cole, American Smelting & Refining Co.; Cecil Fitch, Chief Consolidated Mining Co.; O. N. Friendly, Park Utah Consolidated Mines Co.; C. F. Hansen, American Gilsonite Co.; M. G. Heitzman, Silver King Coalition Mines Co.; Otto Herres, Combined Metals Reduction Co.; Paul H. Hunt, Park Utah Consolidated Mines Co.; James Ivers, Silver King Coalition Mines Co.; Thomas F. Kearns, Silver King Coalition Mines Co.; Tom Lyon, International Smelting & Refining Co.; S. W. Norton, Pacific Bridge Co.; A. G. Mackenzie, Utah Mining Assn.; F. S. Mulock, U. S. Smelting Refining & Mining Co.; D. D. Moffat, Kennecott Copper Corp.; W. J. O'Connor, American Smelting & Refining Co.; W. C. Page, U. S. Smelting Refining & Mining Co.; M. D. Paine, Tintic Standard Mining Co.; J. D. Shilling, Kennecott Copper Corp.; E. H. Snyder, Combined Metals Reduction Co.; James W. Wade, Tintic Standard Mining Co.; F. A. Wardlaw, Jr., International Smelting & Refining Co.; Clark L. Wilson, New Park Mining Co.

Drill Hole in Ore in Mammoth District

A diamond drill hole is being put down by the San Pedro Mines Corporation on its property between Tiger and Mammoth, Ariz., on what is believed to be an extension of the San Manuel deposit. The overburden at this location was found to be 650 ft. deep, but at 700 ft. the drill is said to have encountered gold and silver ore carrying some copper. Actual drilling is being done by Ben Swope and John Staggs, who are furnishing all equipment and supervising the work. The San Pedro organization is headed by John W. Daily of Tucson, Ariz.

Wheels of Government

(*Continued from page* 49)

to be held in the course of a few weeks.

At the hearings conducted by the Wage and Hour Division on the regulations relating to exemptions for persons employed in executive, administrative and professional capacities, the position of the American Mining Congress was presented by Secretary J. D. Conover. Mr. Conover took the position that the definition of an "executive" employe should be one which reflects primarily the functions and duties performed by the particular employe in question. He proposed that the Taft-Hartley Act definition of the term "supervisor" be placed in the Wage-Hour Act as the definition of the term "executive" employe and that the Taft-Hartley Act definition of "professional" employe be similarly adopted. In the event the present definition should be retained in somewhat its present form by the Wage and Hour Division, he urged that the present confusion with respect to non-exempt work be removed by the further qualification that this requirement not apply in the event the employe is compensated on a salary or fee basis in an amount of $300 or more per month.

St. Lawrence Project

Although Republican Senators Lodge, of Massachusetts, and White, of Maine, and Democratic Senators Connally, of Texas, and George, of Georgia, have filed a minority report of the Senate Foreign Relations Committee in opposition to congressional approval of the St. Lawrence seaway and power project, Senate leaders have set consideration of this legislation for early action on the calendar. The minority report asserts that the project is "an annihilation of the treaty-making power of the Senate." Meanwhile Chairman Dondero's (Rep., Mich.) House Public Works Committee will renew hearings on the project in February. As matters stand, the bills approving this extravagant proposal are riding toward enactment unless determined opposition develops. Senators Vandenberg, of Michigan. Wiley, of Wisconsin, and Aiken, of Vermont, all Republicans, are ardent advocates of the project.

Freight Rates

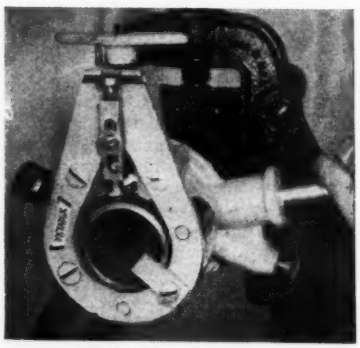
An interim increase in freight rates of 20 per cent above those charged between January and October of 1947, was authorized by the Interstate Commerce Commission on December 30. This applies to railroads, water carriers and freight forwarders and replaces the 10 per cent increase granted on October 6. The new rates remain in effect until June 30, pending the decision on the 30 per cent increase requested by the carriers.

Effective January 5, the new rates are estimated to add $1,230,000,000 to the annual freight charge of the country, although under special exemptions the 20 per cent interim increase actually raises average freight revenues by about 17.5 per cent. The I. C. C. authorization banned any increases in the line-haul rates on iron ore to, or handling charges on, iron ore at the upper Great Lakes ports. The increase on copper, lead, zinc, aluminum and iron ores and concentrates (other than Lake Superior) was limited to 20 cents per ton. On coal, coke, and lignite, the increase is 20 cents per net ton and "when coal, coke, or lignite, are transported by water, preceded and followed by rail transportation, or transported by rail at a combination of two separately established rates, the aggregate amount of the two rail factors shall be considered as the rate to be increased . . . and be subjected to a single increase. A single increase shall also be applied to rail-barge and barge-rail movements of coal, coke, or lignite."

MANUFACTURERS FORUM

Portable Groover Speeds Coupling

Victaulic Co. of America, manufacturers of victaulic couplings and other fittings announces a new portable automatic pipe groover which easily



and quickly converts plain end pipe so that it may be used with victaulic couplings and fittings.

The new device known as the "Vic-Groover" may be operated either by hand or power and grooves pipe in half the time and half the effort required for threading pipe. Cutting perfect grooves to the proper depth automatically, the "Vic-Groover" is light in weight and is easily carried to isolated locations for field grooving.

The "Vic-Groover" is available in sizes to accommodate pipe sizes of from ¾-in. to 4-in.

A descriptive operating catalogue No. VG-47 is available by writing Department P, Victaulic Co. of America, 30 Rockefeller Plaza, New York 20, N. Y.

Screen Equipment Co. Opens New Factory

Announcement was made recently by C. Stuart Fielding, president of Screen Equipment Co., Inc., makers of Seco Vibrating Screens, of the opening of the company's new factory and general offices located at 1750 Walden Avenue, Buffalo, N. Y.

Every modern facility for manufacturing vibrating screens has been installed in this completely modern building. Although Seco Vibrating Screen deliveries have been three to six months behind, expanded facilities will enable prompt delivery.

Patents controlled by the company include the equalizer assembly, which differentiates Seco Vibrating Screens from all other vibrating screens on the market. In addition to the regular line of single, double, triple, and three and one-half deck screens, for screening coal and minerals, the company also manufactures vibrating screens to meet special specifications. An engineering department is maintained for this purpose.

New Motor Adaptable to Mine Usage

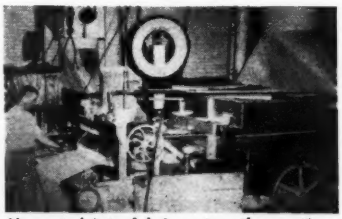
A line of improved totally enclosed, fan-cooled, wound-rotor motors has been announced by the Allis-Chalmers Manufacturing Co., Milwaukee, Wis. The motors are built with an improved tube-type air-to-air heat exchanger, first used for squirrel-cage motors. Greater efficiency permits a reduction in size compared to older designs.

The improved motors are suitable for all fields of industry, since they can be readily adapted to suit the requirements of any special industry.

To assure trouble-free operation under extremely unfavorable atmospheric conditions, the motors can be built with stainless steel ventilating tubes, fans and end plates and cast iron terminal boxes and collector ring enclosures.

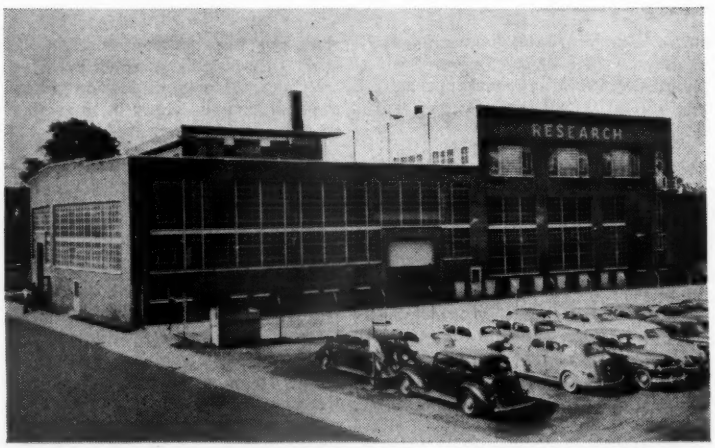
Plastic Coating Improves Life of Mine Vent Tubing

Vinyl plastics, which are thermoplastic resins with remarkable properties, are rapidly coming into extended use. Their great resistance to wear, especially puncturing and abrasion is



Uncoated jute fabric enters the coating machine to receive first application of plastic coating.

required in fabrics receiving rough mine usage. Materials thus coated are flame proof, mildew proof, and impervious to moisture and water. Vinyl plastic coated mine vent tubing is light in weight and easy to handle in storage, installation, and removal. This new tubing, now in production in the American Brattice Cloth Corp.'s plant in Warsaw, Ind., is available in two grades to meet either average or



View of the recently-completed Research Center of The Jeffrey Manufacturing Company, Columbus, Ohio. It is said to be modern in every respect and equipped to perform tests of sufficient scope to insure accurate predetermination of field results, also the construction of experimental and pilot plant equipment. Experienced testing and development technicians and engineers supervise the performance of all laboratory work

extremely severe mine conditions. Bulletin 107 describing this new mine vent tubing is available on request.

Threadless Malleable Fittings

Flagg-Flow malleable pipe fittings, the first threadless malleable fittings made for brazed pipe joints, have been introduced to industry by Stanley G. Flagg & Co., Inc., of Philadelphia.

In announcing the new development, S. Griswold Flagg, president of the company, said the revolutionary

Final step in making a Flagg-Flow Joint. Alloy flows into clearance between the cup and the pipe wall.

threadless fitting simplifies any piping layout and makes it possible to join steel or wrought iron pipe without threads and without welding by a brazing method any competent pipe fitter can use.

Described as the first joint ever produced that opens the way to reducing the wall thickness and weight of pipe, Flagg-Flow enables the use of plain end pipe, eliminating thread cutting which otherwise would weaken the pipe wall by reducing its thickness. The new fitting makes possible the use of lighter weight pipe throughout the system.

Cummins Introduces Line of New Service Parts Kits

A new and complete line of 31 Service Parts Kits, designed for use in overhauls of Cummins Diesel Engines, has been introduced by Cummins Engine Company, Inc., Columbus, Indiana.

The entire line of Kits is described in detail and illustrated in a 36-page Parts Kit Catalog which has just been published. This booklet may be obtained from any Cummins Dealer or from Cummins Engine Company, Inc.

Conveniently-packaged and easily-stored, the Kits will help engine owners complete their overhauls easier and faster and provide important savings on each overhaul, according to the Cummins Parts Merchandising Department. Kit prices, it was pointed out, are considerably less than the cost of the parts purchased individually.

Company stocks of Kits are maintained by Cummins Dealers throughout the United States.

— *Announcements* —

Charles E. Wilson, president, **General Electric Co.**, announced that **Henry V. Erben** has been elected a vice president and general manager of the apparatus department, largest of the seven G-E operating departments. Mr. Erben succeeds **Roy C. Muir**, who has retired after more than 42 years of service.

On the retirement of **Jesse W. Lewis**, after more than 37 years of service, **John D. Lockton** was elected treasurer of the company.

* * *

Edwin H. Johnson, formerly chief engineer of mines for the Republic Steel Corp., has accepted a position with Kennametal Corp. as sales manager, Mining Division.

* * *

The I-T-E Circuit Breaker Co., Philadelphia, has announced the election of **Roy E. Murphy** to vice president in charge of sales. He will be in charge of coordinating the combined selling of I-T-E and its subsidiary, the Railway and Industrial Engineering Co., Greensburg, Pa.

* * *

Appointment of **P. L. Edwards** as assistant manager of its central district office in Pittsburgh has been announced by **Raybestos-Manhattan, Inc.**, Manhattan rubber division, Passaic, N. J. Mr. Edwards, who has been manager of the products division of Manhattan's Western District Office, has been with the company 29 years. He took over his new duties on January 1.

* * *

H. A. Pratt, formerly superintendent of the Kent, Ohio, plant of the **Davey Compressor Co.**, has been appointed as parts and service manager, after 20 years of company service.

* * *

Mack Trucks, Inc., in New York City, announced that **C. W. Haseltine**, vice president, secretary and treasurer and director of the Mack Manufacturing Corp., has retired. Mr. Haseltine's vision and ability had a great influence on the growth and development of the Mack organization.

F. W. Sommer has been appointed as treasurer and **T. V. Homan** as secretary of the company. Headquarters for the new officers will be at the home office, Empire State Building, New York City.

* * *

Marion Power Shovel Company of Marion, Ohio, announces the appointment of **William F. Lanius** as sales representative at Portland, Oreg., succeeding **Joseph Reed**, who had represented the company in that territory for the past seven years. Mr. Lanius' territory will consist of Washington, Oregon, Idaho and Montana.

He formerly was an erecting engineer for Marion and consequently brings to his new position a background of knowledge about structural details of Marion machines. For the last 12 years he has been with The Kaiser Company.

Mr. Lanius is making his headquarters at 2505 Northeast 33rd Avenue, Portland, Oreg.

Catalogs and Bulletins

GASOLINE AND DIESEL ENGINES. *Hercules Motors Corp., Canton, Ohio.* This new catalog gives to power users an up-to-date knowledge of the complete line of Hercules gasoline and diesel engines and power units now available in a range from 300 to 400 hp. The catalog lists and describes in detail engines, Hercules engines and power units and gives pertinent information to assist the power user in choosing the most suitable equipment for his particular application. One section of the booklet is devoted to accessories, power take-offs and reduction gears.

HYDRAULIC EQUIPMENT. *Shell Oil Co., New York City.* Prepared under the direction of the Shell Lubrication Department, this 44-page booklet gives a simple and comprehensive review of hydraulic principles and problems involving the use of oil—hydraulic mechanism. The booklet is profusely illustrated with cutaway drawings, photographs, and diagrams. There are brief chapters on hydraulic system and equipment, hydraulic oil requirements and performance characteristics, hydraulic principles, and the maintenance and cleaning of hydraulic systems. For those who use heavy-duty trucks, oil pumps, or machine shop equipment, this book will be especially useful.

POWER SHOVEL. *Bucyrus-Erie Co., Milwaukee, Wis.* Bulletin No. 38-B-2 is a 32-page booklet describing Bucyrus-Erie 38-B machine. This bulletin replaces the one describing the 37-B which is now obsolete. Profusely illustrated with photographs, the booklet also includes tables on shovel working range, working loads, and power specifications.

RUBBER TRANSMISSION BELTS. *B. F. Goodrich Co., Akron, Ohio.* Catalog section 2150 is a 12-page bulletin entitled "Selection and Maintenance of Rubber Transmission Belts." This publication is a guide to the application and care of flat rubber belting. Discussing first the problems facing the purchaser of a flat belt drive as regards which type, grade, width, thickness and length he should select, the booklet lists commonly used sizes, minimum pulley diameters and various grades of belting, and their horsepower capacity. Numerous tables are included on horsepower, the formula for finding the arc of contact, horsepower capacity and belt speeds. Instructions on proper care and maintenance of rubber belt, and suggestions for keeping performance records of various belts, are also included.

SLURRY PUMP. *Pettibone Mulliken Corp., Chicago, Ill.* A 16-page bulletin describes this new Slurry Pump whose wear parts are centrifugally cast of abrasion resistant alloy. The text includes a detailed description of the pump, engineering and pumping data, dimensions, a selection chart, assembly drawings, and a complete list of parts.

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Satisfactory cores guaranteed

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Vibrating Screens and Vibratory Riddles, in many sizes and types, all priced most reasonably. . . . Tried, Proved and Guaranteed Products. eaders in Screening Field Since 1919.

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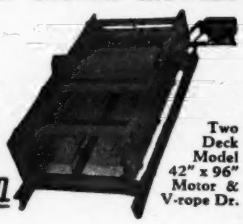

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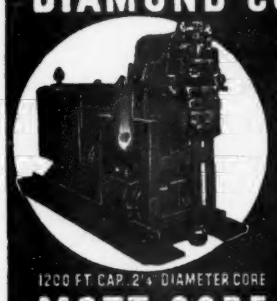

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MINING MACHINE AND
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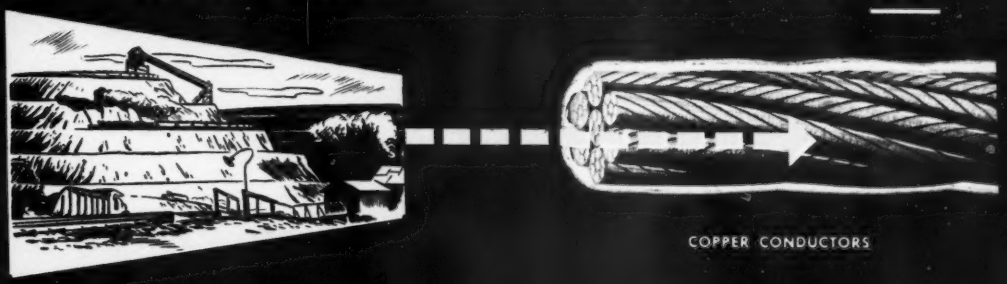
TO INSURE TOP PHYSICAL AND ELECTRICAL PROPERTIES, the conductors of U. S. Royal Cables are of annealed coated copper, the stranding of which is designed specifically for the service requirements of mining machine and locomotive cables. The greatest possible flexibility and efficiency are provided right from the start.



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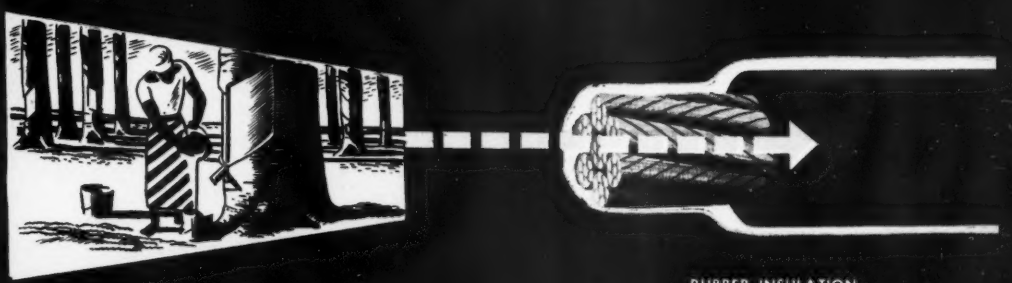

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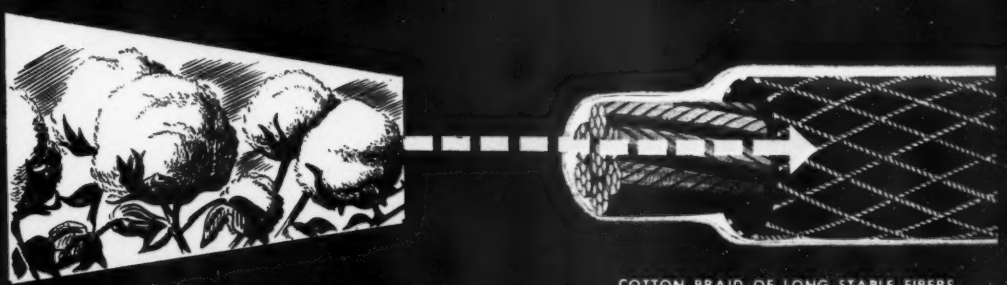
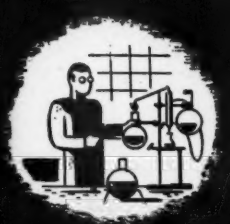


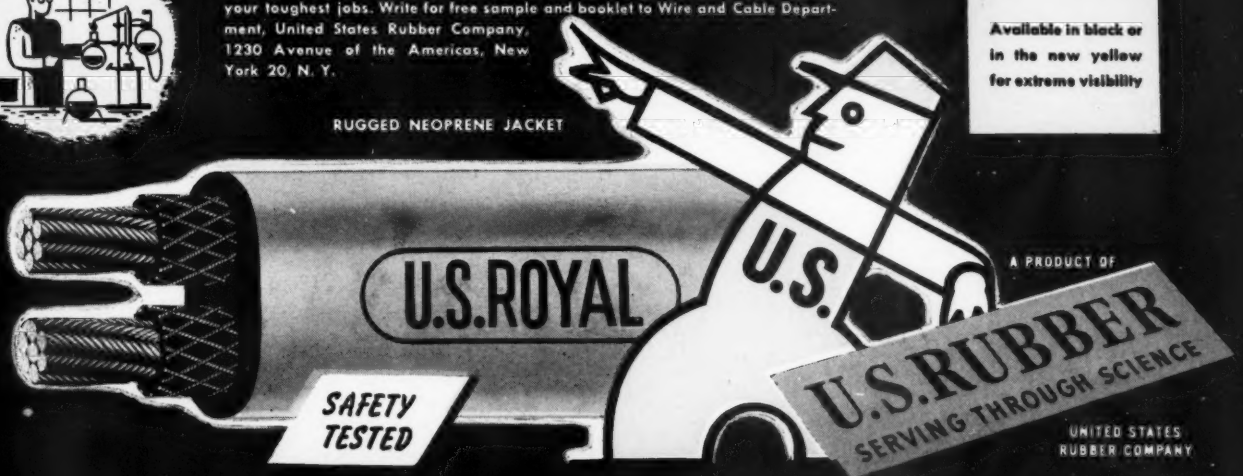
COTTON BRAID OF LONG STAPLE FIBERS



IN THE LABORATORY United States Rubber Company scientists developed a special, tough, *pressure cured* Neoprene jacket, which provides maximum resistance to abrasion, cutting, heat, moisture, and especially oil. In addition, U. S. Royals must pass 7 gruelling "torture" tests before being certified as safe for your toughest jobs. Write for free sample and booklet to Wire and Cable Department, United States Rubber Company, 1230 Avenue of the Americas, New York 20, N. Y.

RUGGED NEOPRENE JACKET

Available in black or in the new yellow for extreme visibility



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M·S·A TWO-HOUR OXYGEN BREATHING APPARATUS

The famous M.S.A. McCaa two-hour apparatus, recognized standard of the mining industry, supplies complete respiratory protection to the wearer in unbreathable atmospheres for a minimum of two hours, under hard physical exertion. Approved by the U. S. Bureau of Mines, the Two-Hour Apparatus employs a high-pressure oxygen cylinder, and a regenerator which purifies expired breath by removing the carbon dioxide, returning the oxygen content to the circulating system. The Apparatus is the cornerstone of mine protection and rescue programs. Write for Bulletin BB-3.

M·S·A SELF-RESCUER

A miniature gas mask, U. S. Bureau of Mines-approved, belt carried, hermetically sealed until used. This handy, popular equipment protects user against carbon monoxide after fire or explosion for at least 30 minutes. Bulletin EC-74.

H-H INHALATOR

Used in conjunction with artificial respiration, the H-H Inhalator speeds effectively the work of resuscitation by supplying correct oxygen-carbon dioxide mixture to the patient's lungs according to demand—gently, naturally, safely. The Instrument is officially accepted by the Council on Physical Medicine of the American Medical Association, approved by the American Gas Association and the Association of Police and Fire Surgeons. Write for descriptive Bulletin CA-9.

M·S·A Chemox OXYGEN BREATHING APPARATUS

Making its own oxygen with a single, replaceable canister as the wearer breathes, Chemox provides a minimum of 45 minutes' respiratory protection in unbreathable air, and is officially approved by the U.S. Bureau of Mines. Simple to use—Chemox supplements other oxygen breathing apparatus types, can be stored underground—and is always ready for immediate use. Bulletin B-14.

M·S·A ALL-SERVICE GAS MASK

Light in weight, comfortable to wear, U. S. Bureau of Mines-approved. Provides protection against gases (including carbon monoxide), fumes and smokes, wherever sufficient oxygen is present in air to support life. Long-lived All-Service canister is quickly replaceable when required—All-Vision facepiece can be put on and adjusted rapidly—sturdy harness contributes to wearing ease. Bulletin EA-8.

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